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THE AUTOMOBILE

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Third Annual Madison Square Show.

American Industry's Largest and Best Representation Given to the Public without Eclat or Ceremonial—Wears a Business Aspect in Marked Contrast to Former Semi-Social Events—Absence of Artistic Decorations Compensated by Greater Refinement of Construction and Elegance of New Cars.

IT was left to the exhibitors and the public to make a success of the opening of the third annual automobile show at the Madison Square Garden last Saturday. The ceremonial of the occasion consisted simply in throwing the doors open at 8 o'clock and permitting the crowd to buy tickets. The two organizations under whose patronage the show was held were not present officially, though some of their members were scattered among the early arrivals. Neither Mayor Low or Governor Odell was invited; representatives of the Army or of Congress, of the Boards of Aldermen of Greater New York or of the Legislature at Albany, were all officially ignorant of the event. Delegates from the automobile clubs shone by their absence only. There was a band of musicians, but nobody seemed able to identify it with any well known name in the musical world. Receptions and speeches were not on the programme. In brief, the affair was conducted as a purely industrial gathering of manufactured products, as if the automobile movement had not become part and parcel of the national life, intertwined with human sentiment and full of meaning from a social and economical standpoint.

Such being the conditions, the daily press of New York was starved for readable material, and there was lost a brilliant opportunity for bringing the full importance and significance of automobilism in all its branches before those civil authorities and leaders in finance upon whose impressions and opinions much depends.

However, the doors were opened and

the crowd streamed in in gratifying multitude. Evening dress was the rule, and few seemed out of place in the surroundings, except the leather coated *chauffeurs*, who figured as attendants at many of the stands. Nearly all seemed to be likely purchasers of automobiles and supporters of the movement, and in fact most of them evidently owned or had owned automobiles, for their remarks at the stands disclosed an acquaintance with motor mechanism which put the clerks of the exhibitors decidedly on their mettle.

Not all of the exhibits were installed. Most of the French machines expected from across the ocean were still rocking on the deep, delayed by the storms of a winter passage. The De Dion et Bouton cars, the Decauvilles, the 60 horse power Mors car, and several Panhard machines did not arrive till Sunday, though the Customs House waived the usual formalities of entrance; and as late as Monday evening Clement automobiles and even the American manufacturers of Clement motor cycles were still absent from their assigned place in the basement, while their maker and numerous other French visitors patiently trudged from stand to stand to see whether French supremacy was threatened in our latest developments. If they thought it was, their faces did not betray it, and the hackneyed interviews which they gave out to press representatives, contained only the obligatory admission that undoubtedly our industry would excel in a few years, tempered with the unavoidable assertion that as yet we were somewhat behind. They would not be traders if they said anything different.

The artistic element in decorations of stands was greatly subdued, the elaborate

designs and the finish of the cars themselves taking its place to some extent, but the total impression was not commensurate with the importance of the occasion; neither did it carry out the idea of much effort on the part of the organizers, unless this idea was to avoid pomp and concentrate the attention of visitors upon the individual exhibits.

Whether it was due to this matter-of-fact character and the strictly-business atmosphere which enveloped the visitors as soon as they entered, or to the public's greater familiarity with automobiles, the whole exhibition was already on Monday transformed into a huge mart, in which orders for spring delivery were given and received with such frequency and in such numbers as to astonish the trade. Out-of-town agents were everywhere in evidence, and seemed to feel well satisfied that customers would be more numerous than deliveries at the opening of the driving season. From early indications they represented the catholicity of tastes of the American public, being equally willing to accept a tonneau "touring car" at \$1,250, a steam runabout at \$500 and a gorgeous Roi des Belges creation at \$5,000 as, each and separately, satisfactory value for the money—for different classes of customers of course. The foreign machines were mostly ordered individually from the importers who exhibited them.

Looked upon as a display of types of design and construction, the show was probably in some respects more varied than even the Salon at the Grand Palais. Electric carriages and trucks in all the familiar styles; steam cars ranging from the runabouts which have been in the market for four to five years to essentially new types

built in the likeness of gasoline tonneau cars and equipped with condensers and oil separators; and finally three distinct groups of gasoline machines, dissimilar in purpose, prices and pretensions. These variations of the automobile principle offered testimony by their stubborn return and refusal to yield to a universal pattern, of a much broader and more democratic basis for the automobile industry in the United States than is available anywhere else.

The three groups of gasoline vehicles represented at the show were: 1. The motor-in-front cars of Panhard or Renault pattern, with a clear frame to the rear, to which bodies in many varying designs may be adapted; 2. The cars of American pat-

ties and a few others which refuse to be grouped, will be found in the illustrations

and the special articles of this and following issues.

Progress at the Show in General.

Few were prepared to see an exhibition of such magnitude, and even the most sanguine advocates of mechanical traction on common roads could not escape surprise when the cloth was withdrawn from the statue Saturday night, and this new creation of the artists of the workshop stood revealed in all its unexpected glories of industrial achievement.

There was so much more exhibited than

vincing in the vital matters of driving power and mechanical fitness for the severe tasks appointed to the self-propelled road wagon.

This 1903 opening night did not show merely a few scattered examples of future possibilities, but a great assemblage of vehicles of sound mechanical design, thoroughly good in construction, of elegant finish and luxurious in appointment. The observer felt all this certainty of achieve-



GENERAL VIEW OF RESTAURANT EXHIBITS, SHOWING CLEVELAND AND ELECTRIC VEHICLE CO. MACHINES.

tern, in which the position of the motor mechanism is designed with reference to a certain style of carriage; and 3. The small cars designed principally with regard to price, but embodying, of course, as much engineering perfection and comfort as their makers have found compatible with that prime consideration.

It is in the last group that the American industry exercises its greatest ingenuity and displays most originality of conception. The second group has fewer representatives than in former years, and is gradually merging with one or the other, or both, of groups 1 and 3.

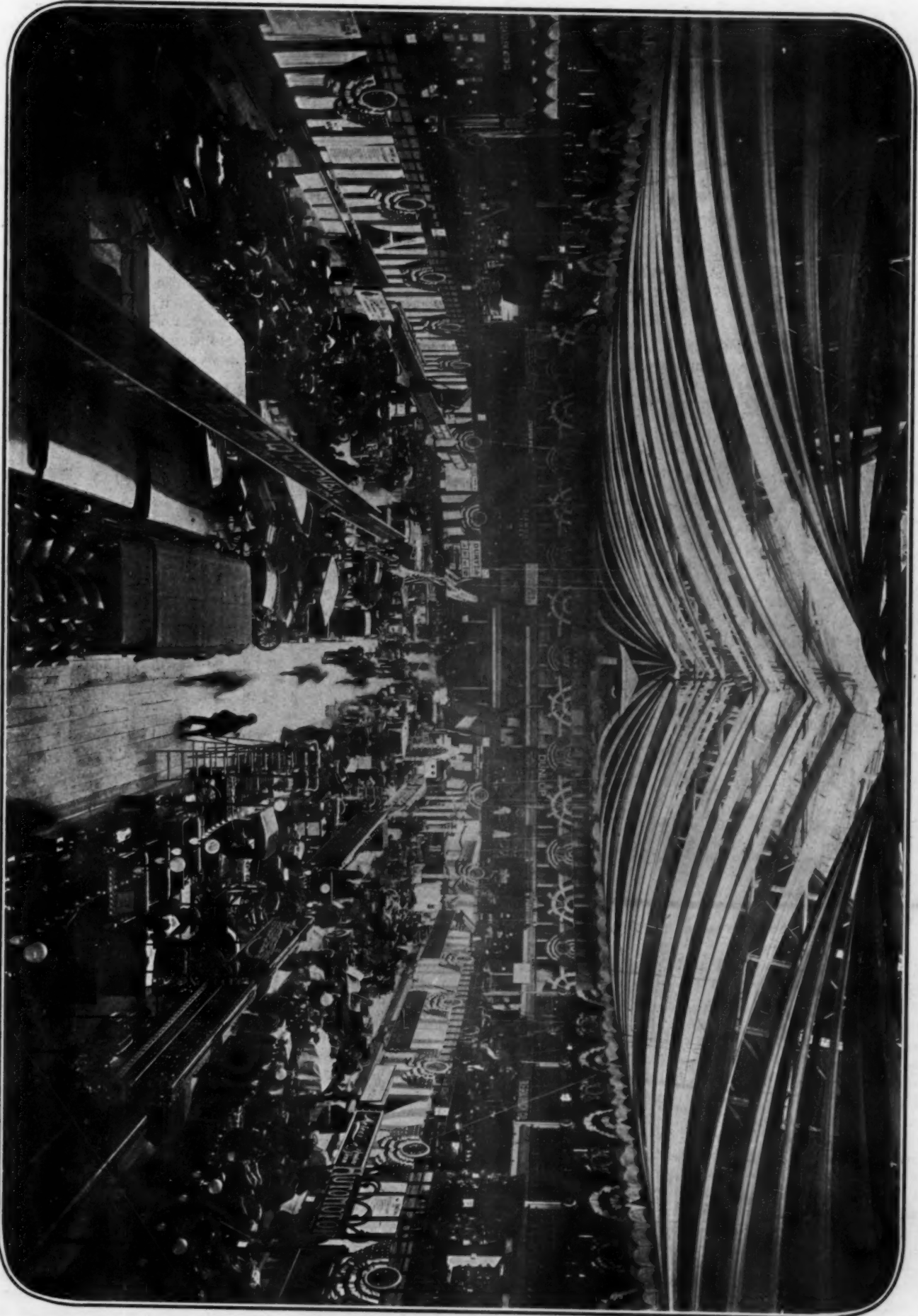
The examples illustrating all these varie-

any one had expected, and that which was shown was so much better than had been anticipated, that the first sensation produced was that of surprise at the extent of the display, at its magnificence, and, as the experienced observer had time to begin to consider details, at the advances toward mechanical perfection shown on every hand. Whichever way the eye turned its gaze fell on something new, and fine, and good. It was not at all as on previous opening nights of Madison Square Garden automobile shows, where a comparatively small assemblage of doubtful wagons was only relieved here and there by costly constructions which were fine to the eye, but not con-

ment before he had time to analyze his impressions and convince himself by a close and critical study of details that the American automobile had arrived and was great enough and good enough to meet the requirements of its employment, and powerful enough to perform with ease the tasks set before it. Suitability to certain fixed requirements was evident in design.

Most satisfying of all to the earnest advocates of horseless traction was the even balance of the different systems of road wagon vitalization. There was no unwarranted forcing of one propulsion method only to the front, and there was no sign of defeat or failure or withdrawal on the

BIRD'S-EYE VIEW OF THIRD ANNUAL AUTOMOBILE SHOW, MADISON SQUARE GARDEN, NEW YORK—MAIN FLOOR AND BALCONIES.



part of the makers of either steam, electric or cylinder-fired motor-driven vehicles. All were there in goodly numbers and firm array, all confident and all eager to prove their powers and certain of ability to render good service.

After the bustle and rush of Saturday came the opportunity for closer observations on the first day of the week, then the full swing of the exhibition on Monday, and at the close on Tuesday, which was really the fourth day of the show, the records of the order books and the triumphant faces of the exhibitors told the convincing story of commercial success, and gave an absolute certainty of financial support to horseless traction on common roads, which it has never before so indisputably had.

It was known that some automobile manufacturers had made large sums in 1902,

to increase in extent and profit of operation) of all American industries. The dream has come true, and the vision is realized. A new era in locomotion and transportation, big with certainties which are as yet guessed by only a few, and fully comprehended by almost none, gives proof of its inauguration by the orders written at this Madison Square Garden automobile event of 1903.

As to details of this new certainty the close of this week will record some decided changes in the convictions of the automobile world. It had seemed that the day of steam wagons had passed its meridian, and that electric traction was handicapped too heavily by battery weight to come in winner in the end, and that the cylinder-fired motor was to be finally accepted as the principal traction agent of the world. Perhaps this last proposition will prove measurably cor-

rectionable, since the indispensable air-cooling coils of the gasoline wagons, placed as they must be prominently at the wagon front, have prepared automobile users to accept a similarly located and equally conspicuous steam condenser at the steam wagon front. When a steam wagon can go on the road safely with only, say, ten gallons of water, which is a condition at once made possible by an efficient condenser, its reserve of power in the boiler, always and instantly available, will go a long way to offset the increased fuel consumption due to the use of water as a vehicle for heat translation into work, over that required to do the same labor when burned between the motor piston and the cylinder head. The steam wagons will certainly stay, and the saturated steam producing generator will stay, and the flash boiler will also be in per-



LEFT BALCONY OF THE GARDEN, FROM MADISON AVENUE END, SHOWING MISCELLANEOUS EXHIBITS.

and it was known, too, that many of the makers of the twenty or twenty-five millions of dollars in value of American automobiles produced in the last year had made no money, and that some of them had gone to the wall. It was also believed that the self-driven wagon was at last able to take care of itself, that it was a substantial mechanical and commercial fact, and that the horse was really displaced as a principal traction agent in the service of mankind, but it required the page entries of the order books at the Garden Tuesday night to prove these assumptions, and the proof was not lacking. The orders were written, and were written time and over again in aggregate, beyond the expectations of the most sanguine. The American automobile has arrived, and has come to stay, and is, at this moment, the most important (and certain

rect. There will surely be an enormous number of "gasoline" vehicles built in the coming year, and many of these will be of the most powerful, elegant and luxurious description. But there cannot be the slightest doubt that the steam wagon will continue to be built in quantities, and to be the choice of a large and strong following of users. The certainty of action of the steam engine, and the reserve of heat in the boiler, either in the water of the saturated steam producers, or in the mass of the flash generators, gives a certainty of propulsion which belongs to no other motive agent, and which will keep steam wagons on the road permanently, so far as can be seen at this writing.

The White steam wagon shows a condenser which returns most of the steam to the boiler and which is not in any way ob-

manent use, and the steam condenser will immediately be recognized as an essential of the first importance.

The steam wagon can carry, say, up to a hundred pounds of water, which does not require replacement, and stand on all fours solidly in the face of the cylinder-fired motor fuel-economy, as being the cleanest and most docile and responsive traction agent of the two. In point of safety, of all the thousands of little steam boilers used in wagons, not one has yet exploded. Steam is safe, clean, silent, docile and efficient, and the makers of the steam wagons show as satisfactory entries on their order books as do the other automobile manufacturers.

The surprise of this 1903 show is the revelation of the willingness of the American public to pay several thousand dollars each, for large and powerful gasoline wagons

fitted with the tonneau, either detachable or built in. Freedom of observation and display are combined in the highest degree in this form of self-driven carriage, and this possibility of seeing and being seen, and the sense of power and mastery which come from control of a large and powerful and showy structure, is the secret of the popularity of the tonneau form of carriage body. So far as comfortable transportation at high speeds is concerned, a covered carriage is infinitely preferable to an open vehicle, but the large open carriage gives a sense of freedom and power and an opportunity of display which appeal forcibly to some of the strongest of the motives of man and womankind, and this form of automobile is certain of very large use and favor.

For elegance of translation, and freedom from all contingencies of delay, the electric

The great numerical preponderance of the cylinder-fired motor wagons shows very clearly the trend of automobile opinion in favor of direct fire-using in wagon propulsion. The exact form of the petrol motor is not yet fixed.

Every possible form of motor is shown, from Balser's revolving 4-cylinder motor, not placed in a vehicle, to the single horizontal cylinder of the Oldsmobile, which simple type of motor wagon is said to have cleared a million for its makers in 1902.

There is a very strong inclination shown to place a four-cylinder motor in front of the vehicle, and there is also a strong support, as most strikingly evinced by the "Cleveland" exhibit, to retain the single horizontal cylinder, or at most to use only two cylinders and obviate the defects of the intermittent propulsive effort as much as may

in changing from his first single horizontal cylinder motor to four vertical cylinders, in a very admirably worked out motor of the latest conception.

Undoubtedly, as time goes on, the multi-cylinder motor will gain increased favor. A constant turning effort on the motor shaft is most desirable for automobile propulsion, and it is the perfect attainment of this fundamental requirement which will always keep the steam wagon on the road, and the quest for this continuous turning impulse applied to the motor shaft will force the adoption of at least four cylinders for the standard automobile motor, in spite of the multiplication of parts inseparable from such an assemblage of motive units.

We shall see steam wagons made in great numbers, not less than now, but very largely in excess of the present production. The



RIGHT BALCONY FROM MADISON AVENUE END, SHOWING EXHIBITS OF PARTS AND SUNDRIES.

vehicle is beyond criticism, where only a limited range is demanded, and this condition obtains in the two extremes of automobile requirements, the private carriage and the heavy truck of dwellers in cities. These are the two classes of vehicles which this 1903 exhibition proves to be the peculiar field of the storage battery driven wagon.

Edison's long expected wonder in batteries is shown at the Garden, not, however, in such display as to be yet absolutely convincing, but taking batteries of well-known types, the beautiful little carriages shown by Baker and the costly productions in the way of fine carriages, and the powerful trucks shown, and placarded as sold, too, by the Electric Vehicle Company, assert the continued use of the electric automobile as an undeniable certainty.

be by the use of the heavy flywheel. This Cleveland automobile venture demands more than a passing notice. The types shown are intermediate between the confessedly cheap form exhibited most prominently by the Oldsmobile and the four-cylinder driven carriages, in which efficiency and abundant and continuous wheel turning power are the first considerations. The "Cleveland" uses either a single horizontal cylinder or two opposed horizontal cylinders, both forms, of course, dependent on flywheel momentum for operation. The evident aim of the Cleveland management is the production of a low-cost wagon, thoroughly reliable in construction, and of the utmost simplicity of motor design, inspired by faith in what may be called the "middle class demand" for automobiles. Packard, on the other hand, shows a total and most elaborate reversal of form.

possibility of the condenser has been shown and the example will force others to follow.

We shall use electric light carriages and electric heavy trucks.

The cylinder-fired motor will be the leading vehicle propulsion agent in point of numbers, and one, two, three or four cylinders will be used for one wagon for a considerable time yet.

The motor bicycle makes no showing at all as compared with the four-wheel vehicles. The Thomas, the Marsh, the Orient, the Hendee and the Merkel are exhibited, but are not centers of attraction. But it is impossible to tell, now, what may be done in the future with the two-wheeled motor vehicle. The motor bicycle has claims to public favor in many directions. Whether these claims are to be at some time fully recognized or not is uncertain.

As to details, the wheel takes a prominent place in the consideration of the automobile designer, and the indications of the abandonment of the wire spoke are overwhelming at this exhibition. While the wire spoke has ample axle load supporting strength, it offers small resistance to side impact, and the suspension wheel offends the eye when placed under a substantial wagon body, because it does not look its strength. On the contrary, the artillery wheel does have the appearance of ability to do its work, and its spokes are not easily bent or broken. Wooden spoked artillery wheels are thoroughly reliable, please the eye and are probably in the best form possible.

The Midgley pressed steel wheel, brazed up of steel sheet cut and formed, retains the artillery wheel outlines, and seems very

The one grand fact of this 1903 Automobile Exhibition is the willingness of the American public to buy fine, large, powerful and costly self-driven vehicles.

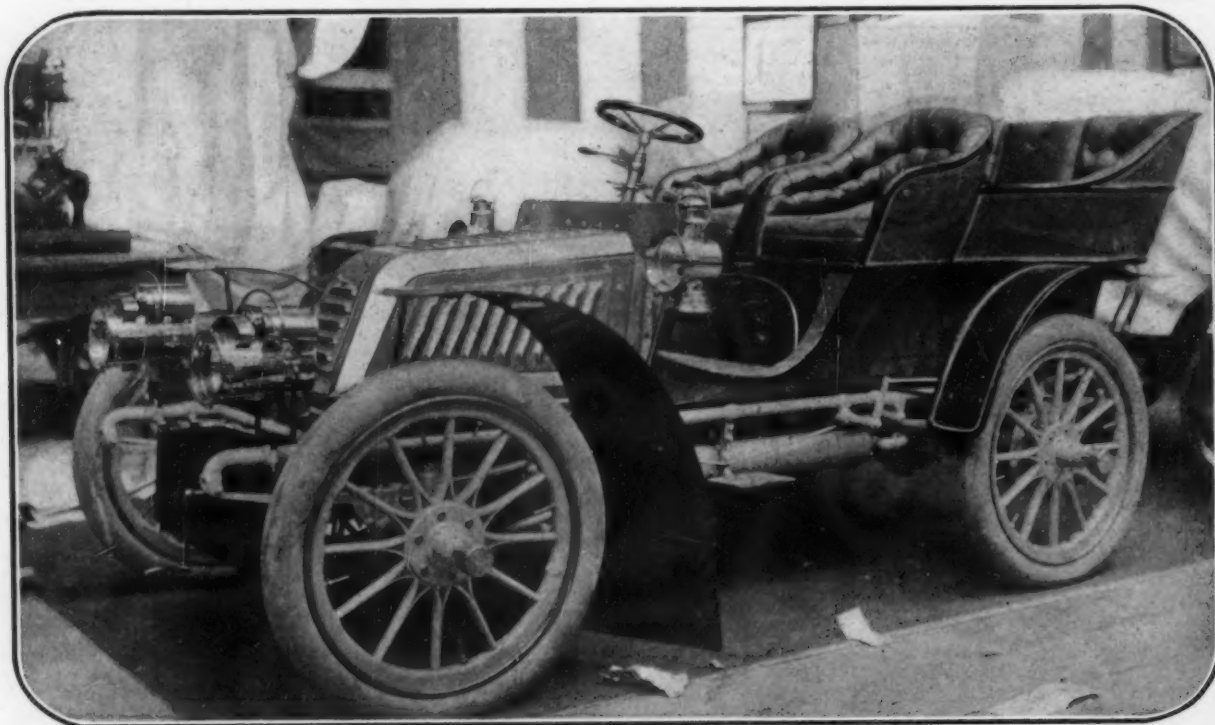
The other vital essential, American ability

to produce wholly satisfactory automobiles, is proved with equal certainty by the admirable collection of wagons of American construction now shown at Madison Square Garden.

Show Novelties and Tendencies.

At least three machines, the Toledo 24-horse power gasoline car, the Cadillac and the Buckmobile, have copper water jackets. Two of these jackets, the Toledo and Cadillac, are rounded in at the outer ends to enclose a portion of the combustion chamber, and this construction permits the jacket to form its own packing at this end, the cylinder head being bolted tightly down on the copper. The Toledo jacket is cor-

horse power, while the Thomas engine is rated at 8-horse power, cylinder sizes not given. The Cadillac car has planetary transmission gearing and two forward speeds, while the Thomas car has three speeds by sliding gears. The same speed—25 miles per hour—is claimed for both cars, but it may be surmised that the Cadillac car at least, and probably the Thomas, will be given considerably greater engine power be-



PIERCE LIGHT "ARROW" CAR, DASH RAKED TO ANGLES OF BODY LINES.

likely to become the accepted standard. It is certainly an admirable creation, as internal reinforcements give an ideal distribution of metal, while the outer surface is smooth and the outlines and cost are the same as the artillery wheel.

The wheel bearings may be balls, or rollers, or they may be plain. Grout's heavier steam wagons abandon both balls and rollers and go back to either plain bearings or coned adjustments.

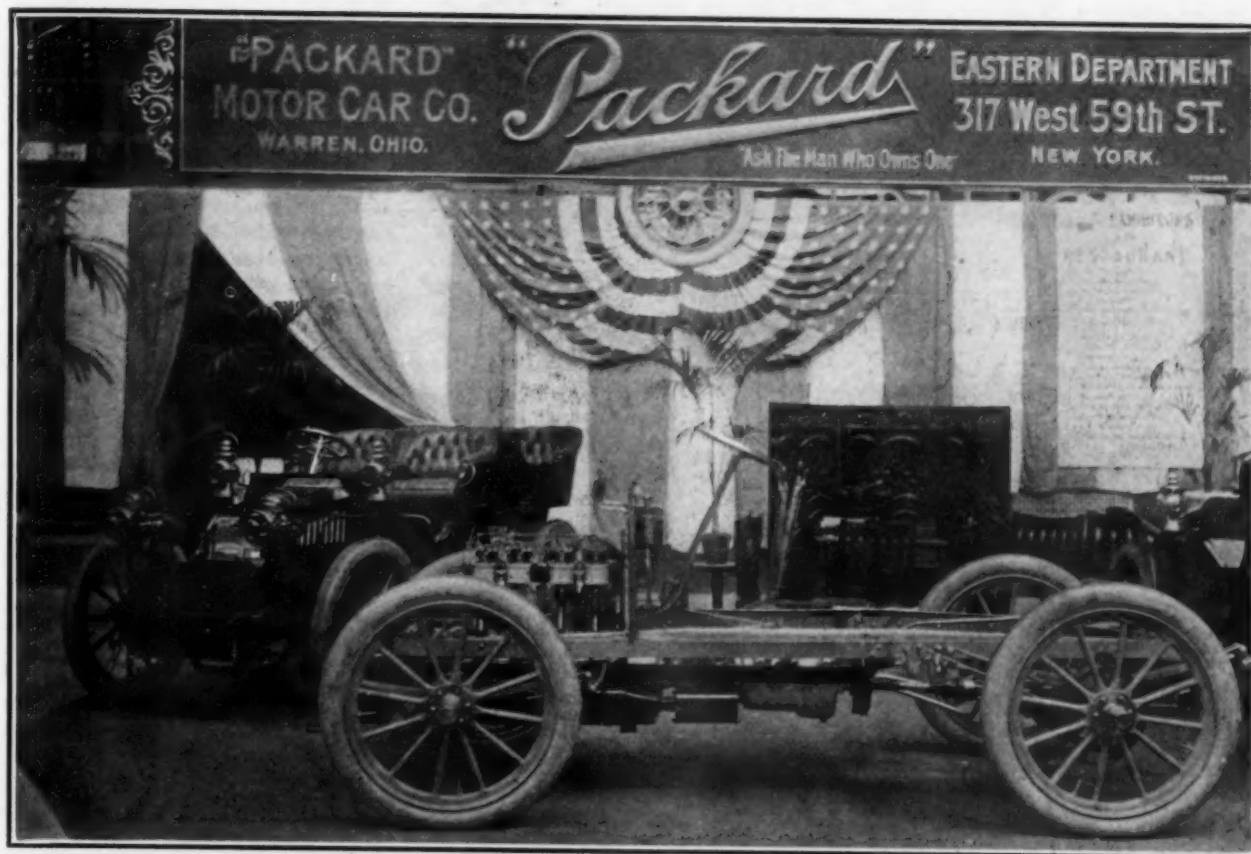
One of the strongest claimants for perfect heavy-load carrying wheel bearings, not seen at previous shows, is the Timken cone-roller bearing, which will be very largely used in 1903 wagons. The Baker ball bearings as used in the Baker electrics, reduce friction to the lowest point, but coned rollers have certain advantages which cannot be overlooked.

rugated, but the Cadillac is not, and it is perhaps yet to be demonstrated that the turned-in outer end of the latter possesses sufficient flexibility to take care of the inevitable expansion and contraction. If it does prove adequate in this respect, it, of course, means an item of economy for all jackets so formed.

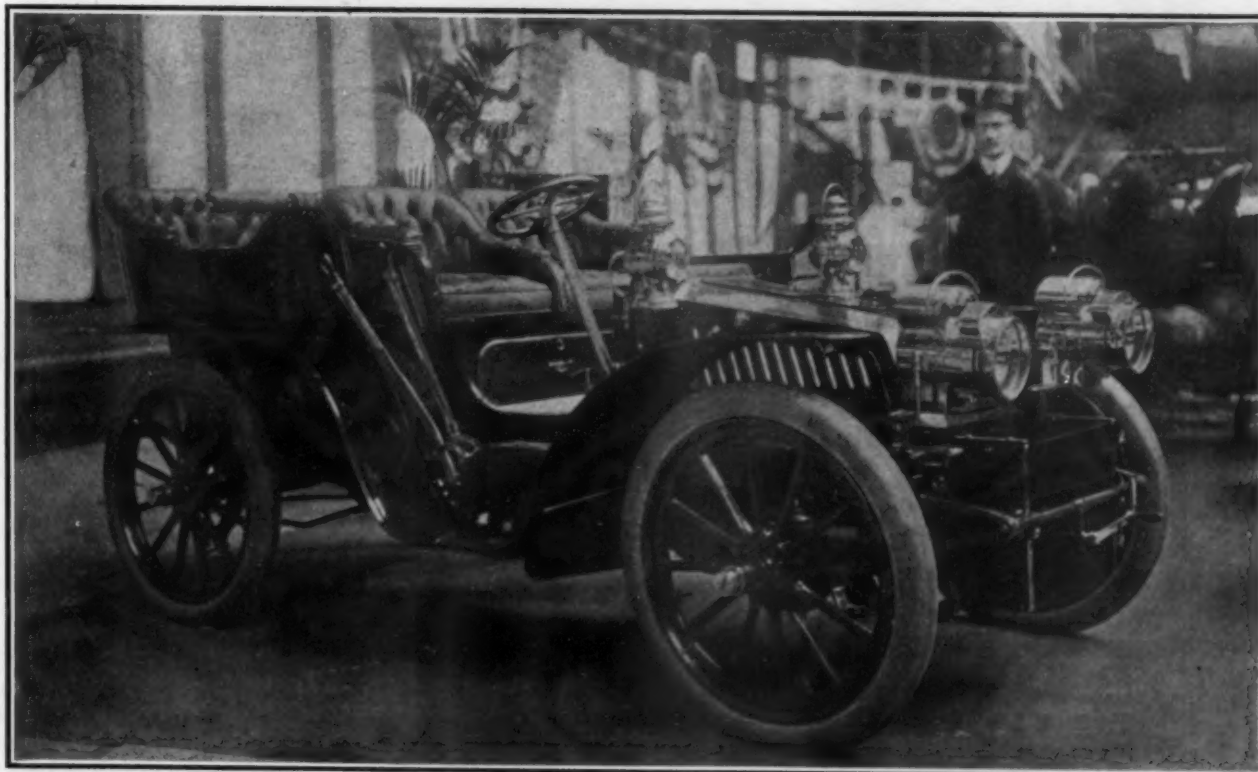
The Cadillac is one of three or four machines properly belonging in the runabout class, but which are provided with detachable tonneaus. Noticeable also in this class is the Thomas family car, as it had perhaps best be called, whose makers announce it as their object to produce a car which, while of moderate weight and speed, shall still have seating capacity for four or five. Both cars have single cylinder horizontal engines, the Cadillac being of cylinder dimensions 5 by 5 inches, and rated at 6 1-2-

fore another year. However that may be, the use in the Thomas car of sliding gears and an intermediate speed, and also of a flywheel clutch and the pedal system of control, singles out this machine in the midst of the general stampede after the planetary gear style of runabout, and merits particular commendation.

When the efforts of one newcomer after another to solve the problem of "the automobile for the masses" are so uniformly resulting, either in abandonment of the effort in favor of the more immediately remunerative touring car, or in surrender to the type just referred to, with single cylinder horizontal motor and planetary gearing, it is refreshing to be able to record a real novelty in this line in the shape of the "motor buckboard" of the Waltham Mfg. Co. With its 3-horse power air-cooled motor



PLAIN BOOTH OF THE PACKARD COMPANY, SHOWING CHASSIS AND COMPLETE NEW TONNEAU.



HIGHEST-PRICED AMERICAN TONNEAU AT THE SHOW—PACKARD 24-HORSEPOWER CAR.

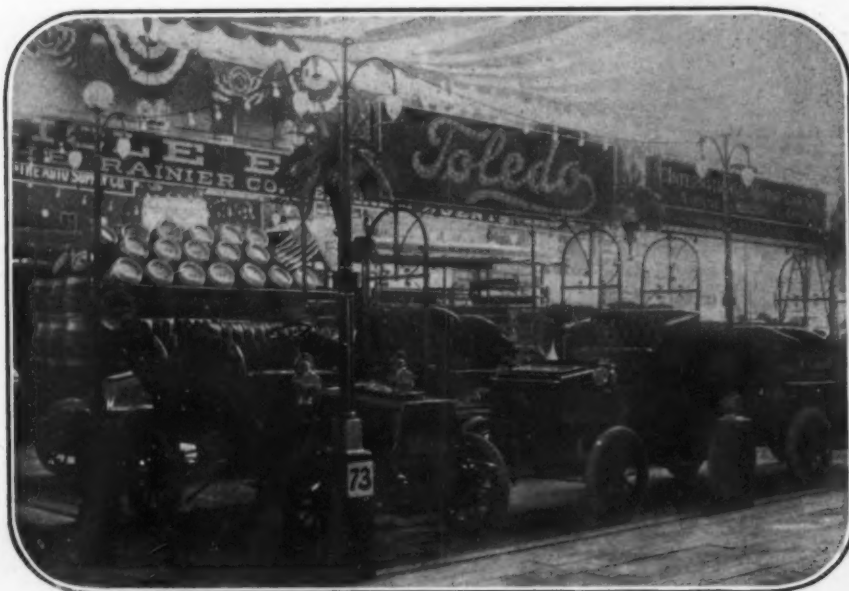
geared to and supported on the rear axle, and its springless buckboard body, this is easily one of the most attractively small exhibits at the show. The direct support of the motor, though it would be out of place

French type is, after all, "the thing" for those who can pay for it. The other is a direct copy of the Renault 24-horse power car, and in its transmission system the maker has returned to his first love, for the

motors, the Kelecom and the De Dion respectively. Adding these to the Ward Leonard and most of the lighter motor-front cars, we find in this type of machine a decided numerical preponderance of motors with speeds exceeding 1,000 R.P.M.; and it may incidentally be remarked that in no other type of machine is the immense saving in weight thereby made possible so clearly manifest. Whether a way will be found to make the single or twin cylinder high-speed motor as quiet in its running as the slow-speed motors and particularly the throttled four-cylinder motors now are, or whether the public will accept the noise of these motors for the sake of their efficiency remains to be seen. The single or twin cylinder motor, if placed in front, must have a high speed, else its vibration is excessive; and thus far no one has seemed able to get around this fact. Perhaps a compromise will be effected as in the Autocar, by using a horizontal opposed-cylinder engine.

Among the larger cars with two-chain drive and cross countershaft, most of the newcomers are of the high order of excellence. Conspicuous in this class are the American C. G. V. car, the Pan-American and the Berg. The second of these has but three forward speeds, a feature which characterizes also the Locomobile and Toledo gasoline cars. In the case of the larger of these machines one is probably justified in expecting to see a fourth speed added in another year.

In the matter of frames, most American builders seem to be taking up the false

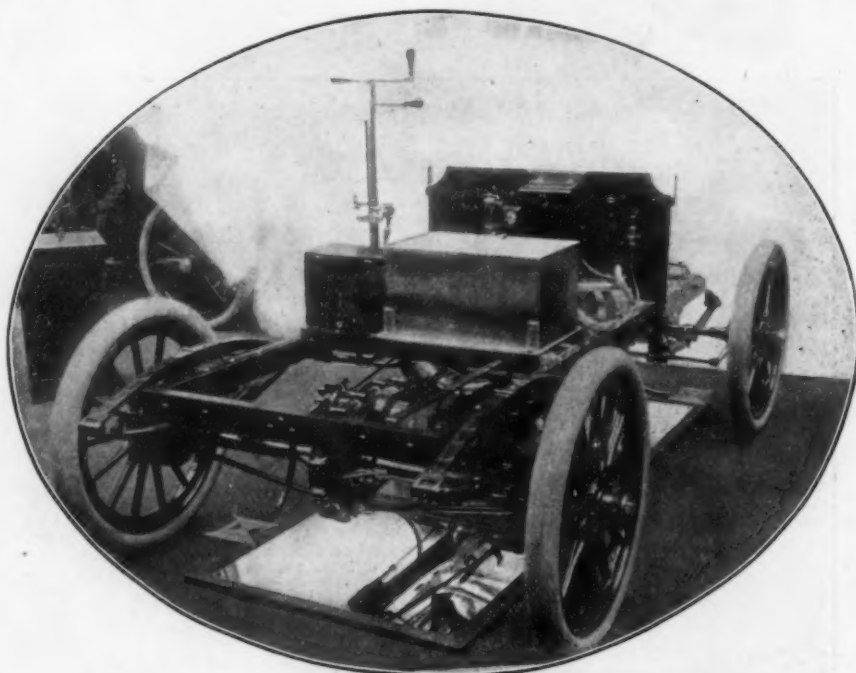


TOLEDO GASOLINE CARS AND VEHICLE EQUIPMENT ELECTRIC TRUCKS.

in a larger machine, is only of a piece with accepted motor-cycle construction, and the whole affair is astonishingly light. As the motor is at present wholly exposed, one may be pardoned for expressing a doubt as to its efficiency in wet weather, but this is a matter easily remedied. One notes with pleasure also that the Crest Mfg. Co., though producing a slightly more expensive car with shaft drive, have not found it necessary to withdraw the little runabout associated with their name last year. Two or three other makers are showing low-priced runabouts with front motor and shaft drive, and, although this construction is by rights so expensive that it is difficult to see how it can successfully be put in a cheap car, still, it is possible that substantial results may follow from the efforts in that direction now making. Constructors who find the problem difficult may take heart from the fact that the new 6-horse power De Dion light car with two speeds and shaft drive sells in France for \$800.

A conspicuous feature of the show this year is the widespread drift toward the shaft drive in cars larger than the runabout. For the motor-front light car and, outside of the runabout and a few cars like the Winton and the Haynes-Apperson, nearly everything is motor-front this year—it has come to be the standard design; and it is used even in such large machines as the Packard 4-cylinder 20-horse power car, now exhibited for the first time, and the 24-horse power Ward Leonard. The former car, which in workmanship, design and finish is easily in the front rank of the American cars shown, may be regarded as registering its makers' conviction that the

Renault system of meshing the gears from the tips of the teeth is once more used. The writer understands, however, that either this or the commoner sliding gear system will be furnished, and the price made to correspond.



AUTOCAR CHASSIS WITH MIRROR BENEATH TO SHOW CONSTRUCTION.

Among other new cars using the shaft drive may be mentioned the Walter, Kensington and Pierce "Arrow" cars. All three of these use tubular main frames, and the latter two have twin cylinder high-speed

frame just when the French are dropping it. The false frame is probably the simplest device for obtaining substantial alignment of shafts between the engine and the gear box, but it adds something to the expense.

and the French are learning to omit it, and either to secure the needed alignment in other ways or to dispense with the need of it. The problem is an interesting one, and not quite so simple as it sounds, since it is not permissible to secure alignment by rigidity of the main frame; and the various solutions of the problem which have been found by our transatlantic cousins would well repay careful study. The same may be said of the French frame construction in general, in which the attempt has been quite abandoned to construct a girder of standard rolled steel sections. It is impos-

sible to believe that there is any real economy in building up a frame by riveting angle steel to steel plate instead of stamping the frame sill bodily out of sheet steel in a hydraulic press, as is the most modern practice abroad. Of course, however, the latter construction is impracticable except where large numbers are to be produced.

The increasing adoption of wheel steering gear, even in light runabouts, is gratifying to those who have so long, and for a time to so little purpose, advocated this feature. We see it now not only in the gasoline cars, but in up-to-date steam vehicles.

Old and New Ideas in Radiation.

In the form of radiators, there have been many efforts to get away from the familiar types of flanged tubing and get the same amount of radiating surface with less weight

character of this radiator is shown in Fig. 1, which represents a short section. Instead of one pipe of relatively large diameter (5-8 of an inch or 3-4 inch), about a dozen or

front of the bonnet and is from 3 1-2 to 6 or 7 inches from front to back, according to the size of the engine to be cooled. The water from the jacket discharges into the top half of the tank, from which it de-

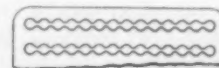
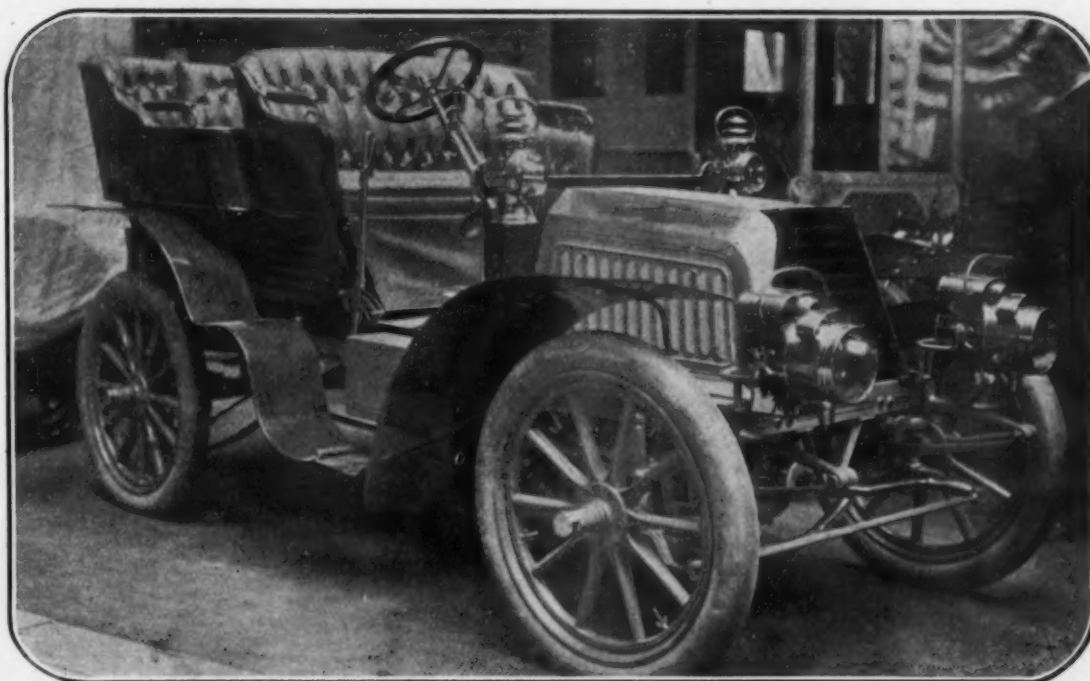


FIG. 2—THE TOLEDO RADIATOR.

scends through the radiator to the lower half and is then taken up again by the pump.

In the Peerless car, this arrangement is modified, as stated in THE AUTOMOBILE of last October 11. The water from the engine jacket passes into the upper tank, which is connected to the lower tank at its extreme ends by straight vertical flanged tubes of 3-4 inch diameter. The water, passing downward through these, is cooled to some



BERG TOURING CAR, BUILT ON PANHARD LINES, AND WITH NATURAL WOOD FINISH.

of metal and all contained water. The now well-known honeycombed radiator used in the Mercedes Simplex, made up wholly of thin horizontal tubes of square section, having their ends soldered together with wire between, to give the spacing for water, would seem to be nearly the last word on this subject, for it has found no direct imitators. The square front radiators of a few other machines, which resemble the Mercedes radiator, are usually of the old Daimler type, with round tubes soldered into flat heads and their appearance more or less cleverly disguised.

The new Panhard type of radiator, however, which made its appearance last year on the Panhard racers abroad, has been extensively imitated, possibly because it is not well protected by patents. The general

fifteen small tubes are strung through elongated flanges which embrace the entire series. The tubes are usually 1-4 inch in outside diameter, and the flanges may obviously be much thinner and lighter than in

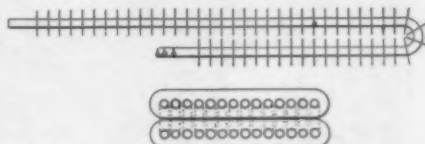


FIG. 1—NEW STYLE PANHARD RADIATOR.

the older type. Usually, though not always, the flanges are crimped to catch the air.

This radiator is perhaps most frequently made a connection between top and bottom halves of the tank, which then occupies the

extent before it goes to the pump. From the pump it goes to a zigzag radiator of the form shown in Fig. 1, and from this to the engine.

In the Toledo 24 horse power car, instead of separate small tubes, a corrugated conductor of sheet copper of nearly the same form is used, and the flanges, instead of being separate and crimped, are flat and continuous from top to bottom. This arrangement is indicated in Fig. 2. This radiator, like the other, forms a connection between top and bottom halves of the tank.

A novel modification is shown in the Automotor. The tank of this car had its top and bottom halves *AB* (Fig. 3) connected at the ends by water legs *CC*; and between the legs by conductors *D* folded and soldered from sheet copper, wide and very

thin, and set with their edges to the wind. As shown in Fig. 3, they are slightly corrugated, and must altogether have been a rather difficult thing to make. The new Columbia car, shown by the Electric Vehicle Co., has a somewhat similar radiator, but without the water legs C C; and indeed it is not quite obvious why these should be necessary.

One of the new cars, the Walter, has a radiator, of which the tank portion resembles that in Fig. 3, but whose interior space is filled with 3-8-inch horizontal tubes, having their ends soldered into C, making a much cheaper, though less efficient, construction.

Transmission Gears.

In a general summing up of the transmission gears seen at the show, there are at least two systems that seem to be very much in vogue, and one or two radical departures from these types, which are

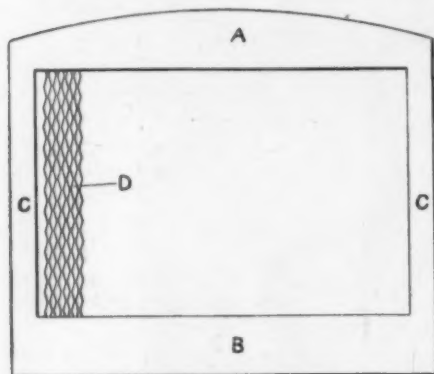


FIG. 3—AUTOMOTOR RADIATOR.

quite distinct, novel and interesting. The greater number of manufacturers have adopted the sliding gear system. A sliding gear transmission may be a system of gears mounted on two or more shafts revolving parallel to each other, the main gear shaft being either directly connected to the driving shaft of the motor or forming a part of the motor shaft itself. The other shaft or shafts have gears fixed upon them, but the shafts themselves may be moved longitudinally so that any one of the gears thereon, which mesh pairwise with those upon the fixed shaft, may be slid into mesh with its mate to produce different gear ratios from the slow to the high speed, and also the reverse or backward motion.

Most of the larger type of cars are equipped with the sliding gear transmission in some form or other, and in almost every case a brake has been built direct upon the transmission, in addition to the other brakes usually placed upon the carriage.

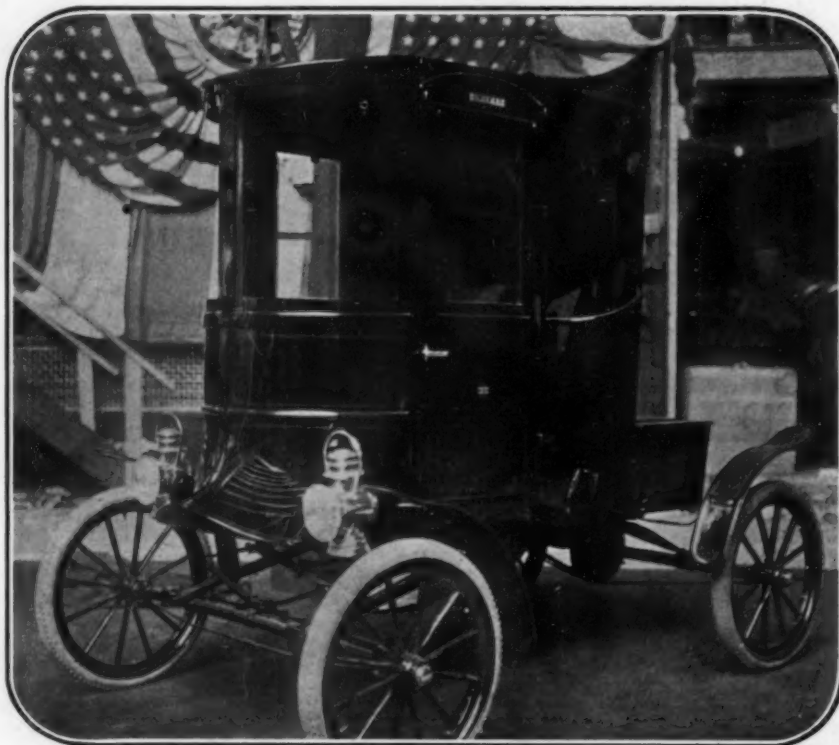
Many of the smaller cars or lighter-powered cars, have the planetary gear system of transmitting power, or what is more technically known, as the "sun-and-planet" type. In a general way it may be said that most of the manufacturers use the sliding



GASOLINE CARS AND CHASSIS IN THE LOCOMOBILE SECTION.

gear transmission with a direct drive on the high speed for the large tonneau, delivery vehicles and high-powered cars and the planetary system on the low-powered and smaller types of automobiles. In regard to the chain drive and the bevel gear drive, the manufacturers at the Show seem about

evenly divided. A great many have adopted the bevel gear, claiming that it has the advantage of being dust proof, and, being incased, may be kept well oiled. In the Union motor truck we find an intensely radical departure from both types, with the ratchet clutch the leading feature.



OLDSMOBILE 5-HORSEPOWER BROUGHAM.

Present Status of Steam Vehicles.

Since the day of Mr. Julius Griffith, who had a steam wagon built by Messrs. Bramah and Sons, London, in 1821, there has been a firm conviction in the minds of a vast number of engineers that the day would come when steam engines would displace horse traction on common roads, and all through the remainder of the nineteenth century this belief seemed well founded, because there was no other fire-driven motor known which at all compared with the steam engine for certainty of action and ease of control; and to-day,

will at least continue to hold their own, and cannot be displaced by the cylinder-fired motor, for heavy road work at least. There are many other motor wagon enthusiasts who firmly believe that light wagons are best driven by steam engines, as indeed they are; there is no question about the suitability of the steam engine for a vehicle motor, but there certainly are many and great objections to the steam boiler and the boiler feed water tank, and perfectly good as the steam engine is for wagon driving, it now seems

lons out of the eleven, and need no boilers and only a little water.

Julius Griffith's wagon failed to reach success in 1821, because of a faulty boiler; now, well toward a hundred years later, we are making, in all probability, as good steam boilers as we can ever make. Dr. Gurney, perhaps first incited by Griffith's work in 1821, had turned his brilliant mind to steam boiler perfecting with such success that in 1825 he built as good water tube steam boilers in design as have ever been produced; he had not our present mechanical aids, but his theory and practice were correct, so far as the then available work-shop possibilities permitted, and



AN ARTISTICALLY DECORATED CORNER OF THE MAIN HALL—EXHIBIT OF MOBILE STEAM VEHICLES.

if steam could be obtained without the use of some kind of a boiler, steam engine driven wagons would leave nothing to be desired, and the horse would very soon become a mere toy for the wealthy or a gambling implement for race-track use, and would certainly suffer industrial extinction. Steam engines are so safe and so certain in action, and so clean, and so docile, answering, as they do perfectly, the movement of a lever, obedient to every wish of the driver, that nothing else can compare with them as vehicle motors. Even electricity is no more flexible and suitable for wagon driving than steam, and there are yet a great many intelligent engineers who believe that steam wagons

certain that the steam boiler and the water tank will not appear in the motive elements of the automobile of the near future. Steam motors are the very best, but until the steam boiler can be vastly reduced in bulk and greatly increased in efficiency as the principal element by which fire is made to turn wagon wheels on common roads, there can be no question as to comparative fuel economy between burning gasoline under a steam boiler and burning it in a motor cylinder. The very best small steam boiler and engine must waste at least ten gallons of every eleven gallons of gasoline or other liquid fuel burned, while the very best internal combustion motors may only waste eight gal-

in 1831 Sir Charles Dance, certainly the boldest and bravest automobilist the world will ever know, burned up a small fortune of \$200,000 or so in placing Dr. Gurney's steam stage coaches before a horse-thrilled public, which would not submit to the probable abstraction of hay, oats and horseshoes from their daily lives, and so taxed these commercially successful steam coaches of 1831 off the road, and Sir Charles Dance retired from this conflict with horse-hoofs, some forty or fifty thousand pounds sterling poorer than when he began to back Dr. Gurney's steam wagon inventions.

In 1829 Sir James Anderson put up the money for steam wagons patented by Mr.

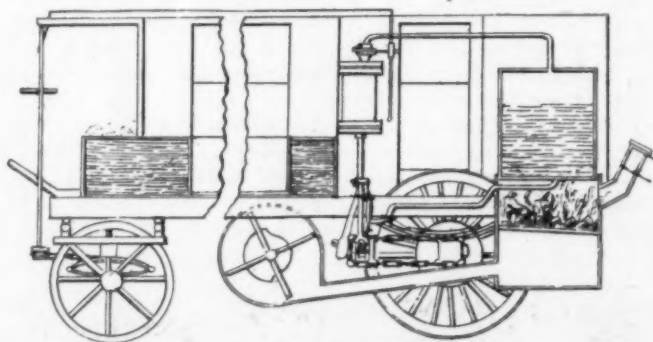
James in 1824 and 1825; James thought he had solved the riddle of the boiler, and used 300 pounds steam pressures, so it will be seen that, save as we have better mechanical resources, we are showing really very small advances over the steam wagons of nearly a hundred years ago, here at Madison Square Garden, in this magnificent automobile exhibition of 1903, where Americans may well be proud to see what is undoubtedly the most varied and the best collection of mechanically propelled wagons ever brought together anywhere. Certainly these 1903 steam wagons would excite the liveliest admiration on the part of the early day constructors, Griffith, Gurney, James and Dance, could those bold, ingenious and courageous adventurers, but walk into the Garden show and see the steam wagons of this first twentieth century decade, little as these splendid steam carriages differ in scheme and method from their own conceptions of so long ago.

Now that the White steam wagons show really efficient exhaust steam condensers, not very bulky, and so well placed vertically in front of the dashboard and upward sloping wagon body as to obtain the best possible air cooling effect without in the least degree injuriously complicating the vehicle construction or in any way at all inconveniencing the passengers, the farthest limit of broad improvements in steam wagon construction seems to have been reached. Probably the water tube boiler has not yet had its day in steam wagons. Crouch showed water tube boilers in his wagons five or six years ago, which seemed to prove that Dr. Gurney was right in believing, in 1825, that the water tube boiler was best suited to wagon

The drawn steel boiler shell, top head integral, is so easily and cheaply made and so strong and in every way good when made, and it is so easy to put from 400 to 600 very thin copper tubes, only half an inch in diameter, upright in one of these

other quick steaming boiler is quite so easily made and repaired, and hence this upright type of multi-fluid steam generator appears to be first choice to-day.

As to the fire, gasoline is the only fuel that finds any favor at all, and in all cases



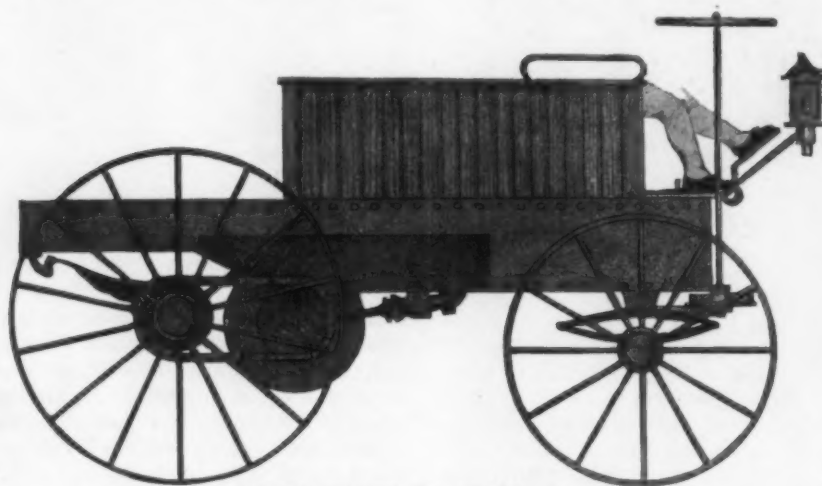
STEAM WAGON OF ABOUT 1830-II.

This wagon has a vertical boiler, vertical engines working downward, chain drive to rear axle, and wheel steering. Other wagons of the period show the jointed steering lever, precisely as now used.

drawn steel vertical boiler shells, that this type of steam generator may be said to be the standard steam wagon boiler form. That highly ingenious Pennsylvania German locksmith, Abel Shawk, showed steam fire engine boilers of the bent water tube type in the late 1850s, which seemed to reach close to the limits of economical steam generation, and Thorneycroft, of the Isle of Dogs, following Dr. Gurney and Mosiev, here on the Hudson River, also appeared to prove that the water tube boiler was best, before Crouch made his elegant wagon boilers so little time ago in Baltimore. But all this only shows how nearly mechanical appliances of widely divergent forms may approach each other in points of cost, efficiency and general fit-

this hydrocarbon is carried under a good heavy pressure in the fuel tank 40 pounds being about the lowest pressure used, and a great deal more being often maintained. The higher the fuel tank pressure the less liable the fire is to blow out, and for this reason the tank pressure has been steadily increased during the past two years, in spite of the fact that gasoline will leak out of a very small hole under a gravity head alone, and that this readiness of escape is very decidedly accentuated by from 40 to 80 pounds of air pressure added. But as it has not yet been found easy to fire a small steam boiler without applying pressure to the liquid fuel, the steam wagon makers are forced to make very strong fuel tanks, and to make them as good as they can possibly be constructed in order to avoid leakage. A leaky gasoline tank is a very dangerous thing, and so long as gasoline tanks must carry a heavy air pressure to successfully supply steam boiler burners the joints of these tanks will require the very best of workmanship.

The maintenance of air pressure in the fuel tank offers a very interesting riddle to the steam wagon designer, which has been answered by widely differing expedients. One wagon has hand controlled valves which can be manipulated so as to turn the steam engines into air compressors when coasting down hill, and so pump up the fuel tank pressure and at the same time retard the down-hill pace of the vehicle by the work put on its motor pistons. Another maker carries a live steam pipe through the gasoline tank and fits a hand valve so that the gasoline can be heated at will, and thus be made to generate its own pressure to any desired degree. Independent steam air compressors are also added in some cases, and all of the steam wagons have manually operated air pumps, by the use of which the two-fold advantages of a good air pressure in the



STEAM WAGON OF ABOUT 1830-I.

The general conception resembles present forms. The drive is by chain to the rear axle, and foot brake and general outlines are not at all strange to our eyes now, nearly a hundred years later.

driving. But the verdict seems to be that Gurney is too recent, and that we must really go back to the very finest American steam boiler patent, issued more than a hundred years ago to Hale, and accept the vertical tube boiler for steam wagons.

ness for intended service, and how convenience of construction will always force a device to the front. There are a lot of things which can be said against a steel boiler shell, crammed full of small diameter vertical copper fire tubes, but no

fuel tank and a good appetite in the midst of the air pump operator may be gained simultaneously. Of necessity the fuel tanks are fitted with pressure gauges, and, taken all together, the fuel tank air-pressure maintenance and regulation combined, ask one of the really hard questions which crop up not infrequently in the paths of the steam wagon constructors.

The water level regulation in the boilers is another knotty problem which has been asked for nearly a hundred years without having yet received a perfectly satisfactory reply. The glass gauge and mirror, supplemented by try cocks and unceasing vigilance on the part of the steam wagon driver, continue to be the principal agents in water level regulation. However, as the boilers will stand a very

ments used in connection with a cylindrical upright boiler were a favorite form at first, same as nowadays. The horizontal engines had advocates in 1831, and some were directly connected to the double cranked rear axle, and others were geared down to the driving wheels. The horizontal engine is the more convenient form so far as keeping the machinery well above the road surface, and giving comfortable seating room for the passengers is concerned, and some present day steam wagons show vertical motors applied to small vehicles and horizontal engines used for larger creations, both by the same maker. As a rule, however, the "steeple" engine, cylinders vertical, placed over the crank-shaft and working downward, is the present choice of the steam

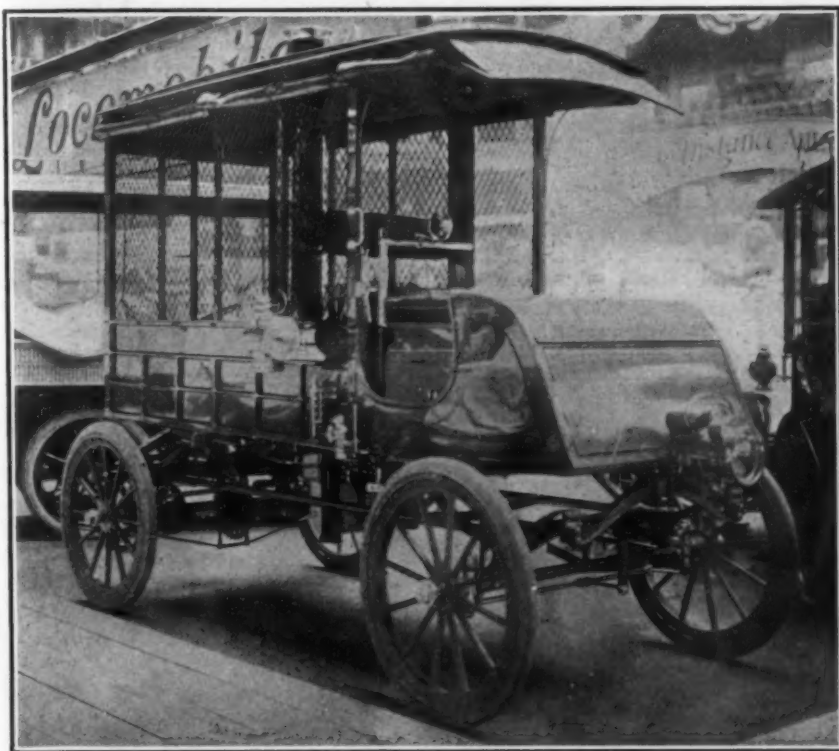
much more used in steam road wagons than it now is.

As between flash boilers and saturated steam producers the rivalry is still keen. Both types are shown, and both are supported by very strong facts and by very evident advantages. The flash boiler, the link and the compound steam engine were unknown in the days of the first steam wagons, and the theory of superheated steam was not well understood in 1830; the early wagon makers were at their wits' ends to obtain saturated steam enough to supply their cylinders, and did not realize the fact that heat, not water, was their actual motive agent. Now that the need for dry steam and high pressure is well known, and the economy of large expansion is fully appreciated, the most advanced examples of steam wagons are showing the flash boiler and compound engine, used with highly efficient air-cooled condensers which actually return a very large part of the water used back to the boiler again. This seems to be an absolutely unavoidable combination, if the steam engine is to be continued in use as a road wagon motor. Every device which will reduce the water tank capacity must be employed.

Thirty or forty gallon water tanks are the rule now, say from 300 to 350 pounds of water, which is non-paying load, and so should be reduced as much as possible on that score, while the large bulk of the big water tank takes up room in the wagon body, which is sorely needed for other purposes. This matter of water bulk makes the condenser loom large in the future of the steam road wagon. If the condenser can be made to return all the water from the cylinders back to the boiler again, then none of the wagons need carry more than ten or twelve gallons of water altogether, and a five or six gallon water tank capacity would answer, and this small water bulk, taken with the undeniably vast superiority of the steam engine over the gas engine as a wagon driving agent would go a long way toward keeping the steam wagons in favor, even in the face of the gas engine driven wagons shown by the Locomobile and the Foster steam wagon advocates.

Unquestionably the boiler and the water tank must be as small as they can possibly be made, and the condenser is an imperative necessity. So much is certain.

The flash boiler is not so sure a proposition. This type of steam generator has long been known and has been the subject of very extended experiment, but has, as yet, not established any widely accepted standard types of form. No two flash boiler users are quite agreed as to what shape is best for the flash boiler outlines, and this is a very strong argument against the probable large adoption of the flash boiler for road wagon driving. However, this is the age of almost unlimited mechanical possibilities, and may yet see a



LOCOMOBILE STEAM DELIVERY WAGON, EQUIPPED WITH STEAM BRAKES.

large variation in water level with no more serious damage than a loss of steam producing effect, and as the driver who is a careless water-tender is very soon taught by his scorched crown sheet to pay more attention to his glass gauge, the water level is carried within practicable limits with less difficulty than might be expected when fire tubes are spaced so closely as they are in these little steam wagon boilers.

As to the choice between vertical and horizontal steam engines, we are in 1903 precisely where the first steam wagon builders were in 1830, and our transmission elements are now chains, the same they were in that early day. A pair of small vertical cylinders working downward, and chain driving from the engine shaft to the driving axle, and these ele-

wagon designers. There are, however, excellent reasons for using the horizontal steam engine in road wagons, and if steam continues to be used largely it is quite likely that horizontal engines will make strong claims for favor.

The slide valve and the link are used almost exclusively to effect the steam distribution, and probably cannot be displaced by any now known form of rotary steam valve, although rotary valves can be made to produce very alluring effects, both for steam distribution and reversing.

Simple engines continue to be very largely in the majority, but the compound motor is shown at the Garden, and shown in very fine form, and the advantages of the compound engine for traction use are well known and undeniable, and the compound steam engine may yet come to be

flash boiler and steam condenser combination which make the multi-cylinder gas engine, with its vastly complicated structure and its comparatively harsh and inflexible action, look the unsuitable wagon motor which it really is, being non-reversible, and very far from obedient to the desires of the wagon user. But the cylinder fired motor avoids the boiler entirely, and needs only a little water and burns less fuel than any equally powerful steam motor demands, and hence, admitting all that can possibly be said in favor of the steam wagon, that elegant vehicle, so loved by Griffith and Gurney and Dance and James in the early part of the nineteenth century, and so advanced in public favor by the labors of

Whitney, the Stanley Brothers and White, in these later days, must certainly face a fierce struggle for existence in the immediate future.

The steam engine is vastly a more suitable motive agent for wagon driving than any other motor now before the public, and if the boiler and the water tank could be eliminated nothing else would be used. How far the flash boiler and the condenser can go toward keeping steam wagons on the road is not yet known, but the continued existence of this vehicle hangs apparently upon the development of water economizing devices, and the flash boiler, the condenser and the compound engine are therefore of the first interest.

HUGH DOLNAR.

Prevailing Types of Electric Vehicles.

In company with the polished brass and gaudy colors of the gasoline cars and the startling innovations which mark the steam cars for special notice, the electric exhibit presents nothing conspicuous or sensational. The individual exhibitors are but few in number, eight in all; there being but one new comer. This branch of the industry, however, is none the worse for the fact that it is mainly in the hands of a few firmly established and well known concerns, and there is no general rush of experimental builders. While at first glance it might seem that but little progress had been made since the last show, a closer inspection will disclose a general improvement. There are no new inventions, no radical changes, but the builders of electric vehicles are taking account of every detail that can contribute to a higher practical efficiency.

In the matter of the source of power, the much advertised Edison battery is displayed in a small booth in a corner of the gallery, while the many large and powerful vehicles on the floor are actually equipped with other makes less known to the outside public but which have fully demonstrated their practical value. The improvements in these batteries are purely in matters of detail, and the question of power supply for electric cars has changed little within the year, but the battery as a whole is more reliable and efficient. The indications are that for an indefinite time to come there will be no radical change, and that improvement will be limited to small details in the battery and increased facilities for charging through the multiplying of stations.

As concerns the motor there is also little change; through minor improvements in design and workmanship the size and weight for a given power are alike decreasing. That the electric car as a whole shows a satisfactory progress is due largely to the general improvement in running gear with the use of larger tires, to

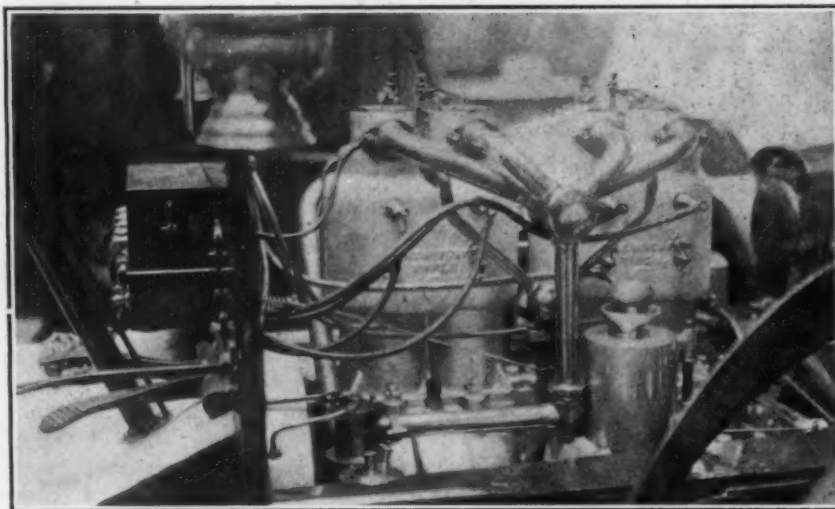
better construction that lessens the friction and wear of the machinery, to better disposition of the weights and to similar matters of detail.

The exhibit of the Electric Vehicle Company, of Hartford, includes a great variety of vehicles from the light electric runabout to the heavy platform truck. The tendency in these vehicles is, wherever the form of body permits, to sling

one of the former is bolted rigidly to the axle in the usual manner, the other is fitted with a round bearing so as to turn on the axle. The rear end of each spring is hung by a shackle joint to the corresponding end of a transverse spring attached to the frame, the wheels being capable of accommodating themselves to rough roads without straining the frame. In the light runabout the body is carried on spring reaches, but a special compensating joint is used to give a similar result. The truck, incidentally, is fitted with the trolley-car type of controller.

This exhibit pays tribute to the prevailing fashion in an electric tonneau with a short square hood in imitation of a motor bonnet, the battery being divided, part under the bonnet and part under the front seat. The body is of the square box form, with tonneau seats extending beyond the sides and skeleton backs to the seats. In all of these vehicles the motors are hung on the rear axle, driving by gears on the rear wheels, the gears being incased. In the truck the motors are hung in the rear of the axle.

The Vehicle Equipment Co. has a large and interesting exhibit of those heavier vehicles which are now so numerous in the streets of New York—broughams, hansoms and victorias, and in particular, the large platform trucks and drays.



PAN-AM FOUR-CYLINDER MOTOR AND CONNECTIONS.

the battery below the body, keeping the weight low and distributing it evenly between the front and rear wheels. This is done in the broughams, hansoms, ambulances and commercial vehicles. In other of the larger carriages, such as the coupes, the battery is divided, one part being over the front and one over the rear axle. Another important detail is the approximation to a three-point support, giving greater flexibility to the running gear. In the heavy truck the platform rests on a frame of channel steel supported by elliptical springs on the rear axle and semi-elliptical springs on the front axle. While

There are also several of the lighter delivery wagons and an ambulance. All of these vehicles are constructed on the Gibbs system, a strongly built body or platform, with four pedestals rigidly fastened to it; the front and rear axle each having a vertical movement, limited by springs, within its own pair of pedestals. The result is a very strong frame, without reaches, and possessing great flexibility. Another distinctive feature of this system is the under-slung battery, in a convenient position for changing, and with weight well distributed. The drive is by pinion and gear on rear wheels.

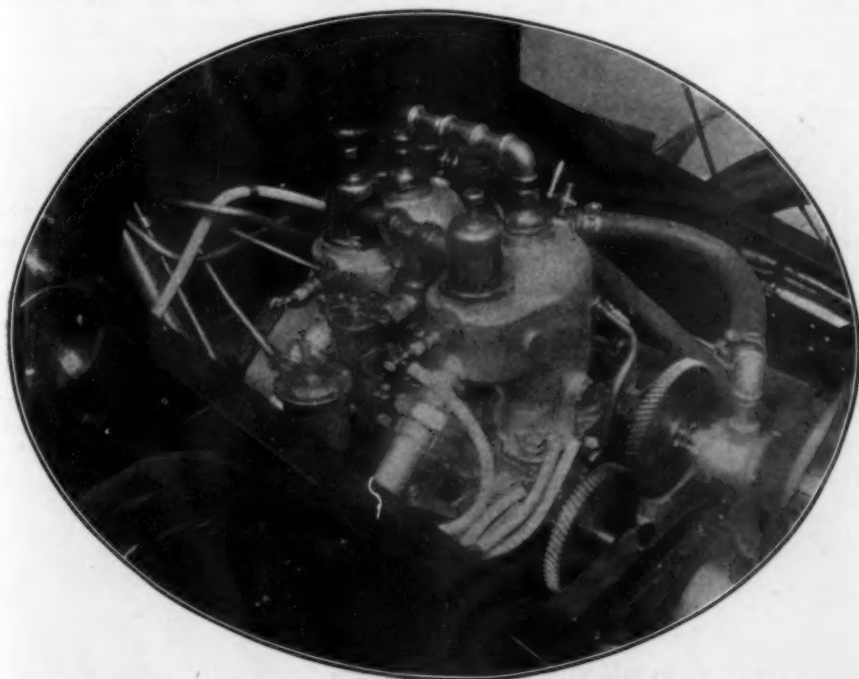
The Studebaker Bros. Mfg. Co. is a newcomer at the Automobile Show. It makes its debut in the new field with a line of light electric vehicles, traps, stan-hopes and runabouts, the result of a

is in the same position, suspended from the rear axle, and driving by means of herring-bone gears in oil-tight cases. The larger cars are fitted with two and the lighter cars with one motor, with the

the rear seat. A very convenient form of delivery wagon has a low box body with under-slung battery, the seat fitted with a buggy top. The position of the body makes it very convenient in loading from either rear or side. The Waverley vehicles are all fitted with the electric brake, the motor being converted into a generator, which is retarded by the resistance.

The National Motor Vehicle Company has made some important changes; the motor, which is built by the company, being entirely remodelled, so that with greatly increased power it is more compact in form. Ample bearing surfaces are provided with a very short case. A single motor is used, geared to a differential. The case of the differential is in two parts, with the central joint threaded, in place of the usual flanges and through bolts, making a case sufficiently strong to permit of the omission of the usual trussing where a motor is carried on the center of a divided axle. The differential and all gears run in oil. The National battery has been changed from 40 cells of 20 amperes to 32 cells of 30 amperes, with a marked improvement in efficiency. The lighter runabouts are fitted with 3-inch tires and the heavier stan-hopes with 32 by 3 1-2 inches, the result of all these changes being a greatly extended radius of action. The controller is fitted with a new device for the reverse through a push button in the handle, with a special catch which ensures positive and certain action.

The well known Baker vehicles are shown in a variety of styles, runabouts, stan-hopes, imperials and Newport, the exhibit being fully up to the reputation of the maker in finish, but with no special departures. The battery is carried within the



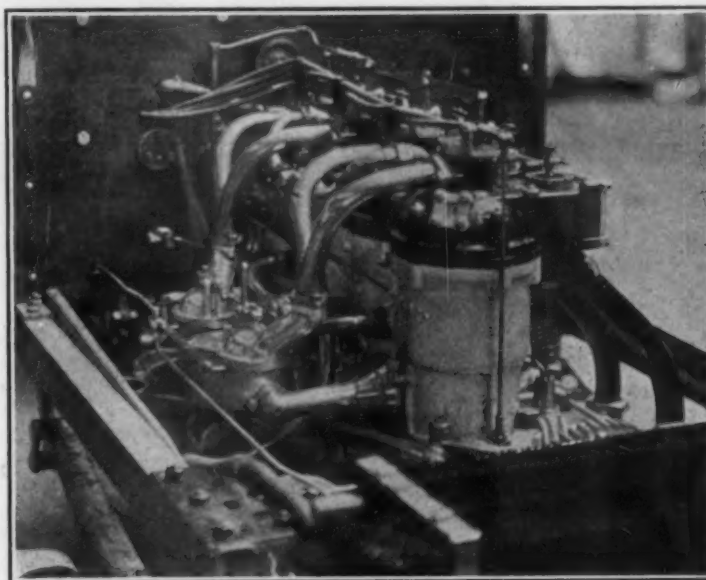
FOSTER 2-CYLINDER MOTOR WITH HELICAL TIME-SHAFT GEARS.

lengthy series of experiment. The design shows one striking novelty in electric cars, a rectangular chassis of steel tubing, the ends of the two longitudinal members being prolonged beyond the front cross tube and turned down to take the front end of the spring, pump handle style, as in the foreign gasoline cars.

The single motor is hung in an arch which is carried in the middle of this chassis, thus being just under the seat. Cast brackets, bored to fit on the longitudinal tubes, carry the steering and brake rods and other attachments. The chassis is carried on two elliptical springs in the rear, and semi-elliptical springs in front. The rear axle is solid, with a differential and sleeves, a chain connecting the driving sprocket with the pinion on the counter-shaft which is a part of the motor; a pair of distance rods between the motor and the arched part of the frame gives a simple and positive regulation of the chain tension. A Westinghouse motor of 1 1/4 horse power is used. The battery is carried on the rear part of the chassis, and is not over the motor. The general arrangement gives a strong and simple construction, well adapted to any form of body. The same construction is employed in the heavy Studebaker trucks now in successful use on rough city pavements with plain iron tires, the springs saving the motor from the shocks to which the axles are subjected.

The Waverley electric cars of the International Motor Co., are this year fitted with a 3-horse power motor in place of the 2-horse power previously used. The motor

double motors each drives by its pinion a gear on the end of the divided axle; where a single motor is used it is geared to a differential. The running gear and body attachment are unchanged from last year, but a greatly increased variety of vehicles are shown. The most interesting of these is a tonneau with underslung battery, the front being in the form of the curved



PACKARD FOUR-CYLINDER MOTOR IN THE CHASSIS.

body of the American type of gasoline car. The sides of the tonneau are carried up to form the backs of the seats. The Waverley surrey has the battery divided, partly under the front and partly under

body and the motor is suspended beneath the center of the body with chain connection to the differential.

The Baker vehicles are all fitted with the rustless wire wheel, which is a spe-

cialty with the firm; some of the other makes list the wire wheels, but the vehi-

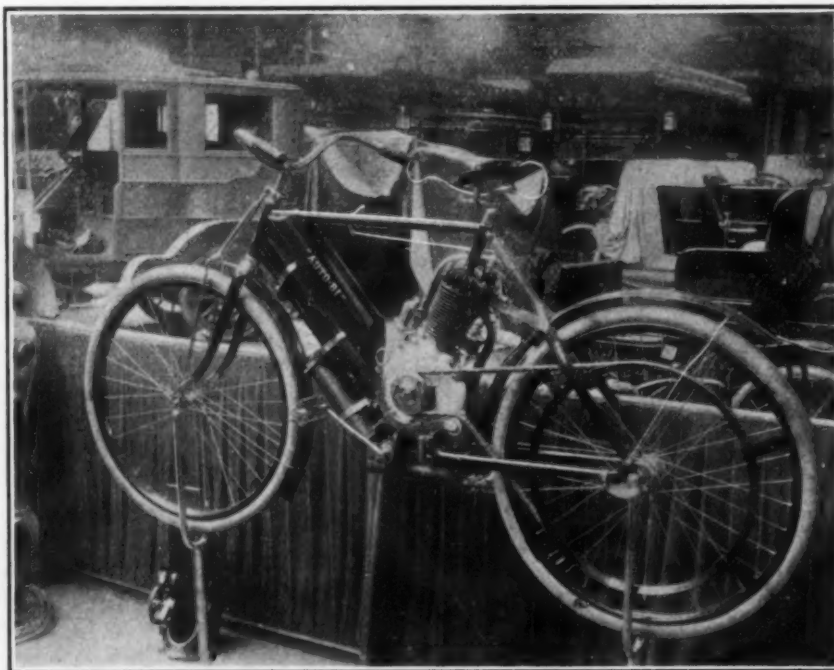
cles on exhibition are fitted with wood wheels.

Motor Cycles on Exhibition.

In the motor cycle class, though but few machines were shown, there was much of interest to show visitors. Many motor cycle dealers and repairmen, and many prospective buyers were at the show for the express purpose of seeing the new models for 1903, and the motor cycle visitors had a busy time of it from the outset.

The Waltham Mfg. Co., Waltham, Mass., showed one of its 3-horse power Orient machines, enameled a bright crimson and striped in black. The Orient is the highest priced machine in the field, and is a very powerful, as well as a strongly built machine. The cylinder of the new machine shown, which is a model of the 3-horse power type to be built by the company, has a three-inch bore, and the stroke of the piston is three and a quarter inches. This makes the stroke about a quarter inch longer than that of the last year's model—to give better compression. The outlet and inlet valves have been enlarged, as have also the radiating flanges on the cylinder head. A strongly made lever idler is used, which permits the rider to instantly throw off the tension of the belt and allow the engine to race in the event of an impending collision, and at the same time allows the nicest adjustment of the belt at all times to suit all conditions. The belt used is one inch wide, of double thickness, and double stitched. The fork crown of the new model is more massive, and is arched a trifle higher than the one used last year. Perhaps the most important improvement is the refinement of the carbureter adjustment, permitting of much more exact adjustment, which should insure a satisfactory mixture once

the rider has learned just how many turns to give to the handle to get the best re-



THOMAS 2 1/2-HORSEPOWER AUTO-BI.

sults out of his individual machine with the grade of gasoline he uses. Different sectional parts of Orient motors are exhibited.

The E. R. Thomas Motor Co., Buffalo, N. Y., had a surprise for all in the new Thomas Auto-Bi. The new machine is an improvement over last year's model in many ways. Perhaps its most distinctive features are its new trussed spring front

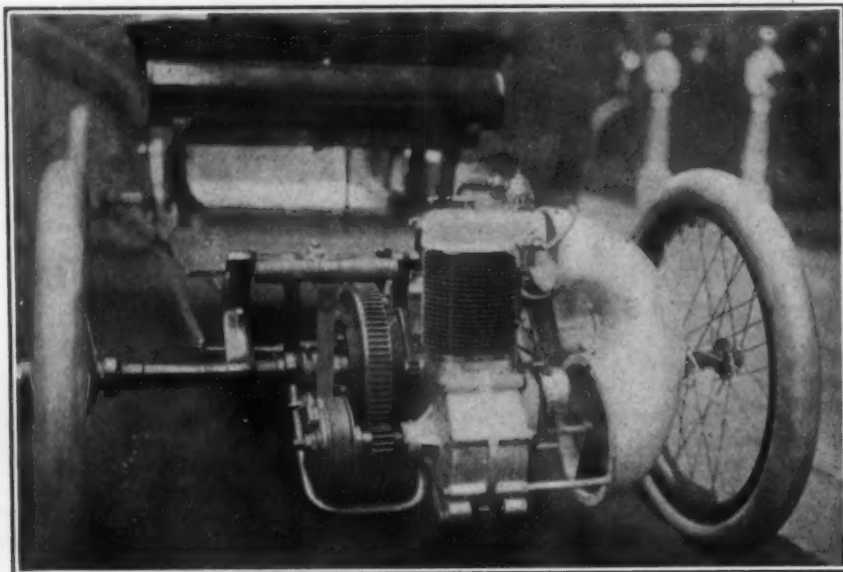
forks and power transmission system. The construction of the former is unique, and at the same time attractive. It is a very strongly made fork, and amply capable of resisting the most violent twisting strain it may be subjected to under all ordinary circumstances. At the same time, it is very resilient, and in connection with the well-known hygienic cushion

frame devices on the rear stays and at the crank yoke, converts the jouncing, bouncing motor cycle into a veritable victoria.

The new machine tips the scale at 100 pounds; its motor has a 2 1-2-brake horse power; power is transmitted from the engine pulley, which has a V-shaped corrugated groove, to the V-shaped rear pulley by means of a 1-8-inch bicycle chain, wrapped in a cover of thick leather. The leather is wound 'round and 'round the chain like a helical spring, and the belt looks not unlike the ordinary twisted belt innocent of non-stretching qualities. A belt of the new style was shown by the Thomas Company, which, it was claimed, had been run over 2,000 miles. It was worn V-shaped from running over the V pulleys, which is really desirable, and looked fit for a good season's work.

The fuel, batteries and coil on the Thomas are carried in tubes running parallel with the lower frame tube. (The tension of the belt is governed by a spring controlled idler.) The carbureter is now placed in such a position that it rests on the crank case of the motor. This should be an advantage in cold weather, as the heat of the motor will keep the carbureter from freezing up. A Luxemburg sight feed oil cup takes care of the lubrication, and though it was not carried out on the machine exhibited, the company proposes to utilize the top tube of the frame for

(Show Report Continued on Page 100.)



MOTOR ARRANGEMENT OF THE ORIENT BUCKBOARD.

Foreign

FRENCH AUTHORITIES AGAINST ROAD RACING?

MEETINGS MAY BE ABANDONED.

Apprehension Caused in French Auto Circles by the Refusal to Sanction the Circular Race for the Pioule Cup—Rumors Regarding the Pau Meeting.

PARIS, Jan. 9.—Considering the more lenient attitude of the authorities toward automobile racing in general it might have been thought that the promoters of events would have been able to carry out their program without running the risk of springing upon themselves such disagree-

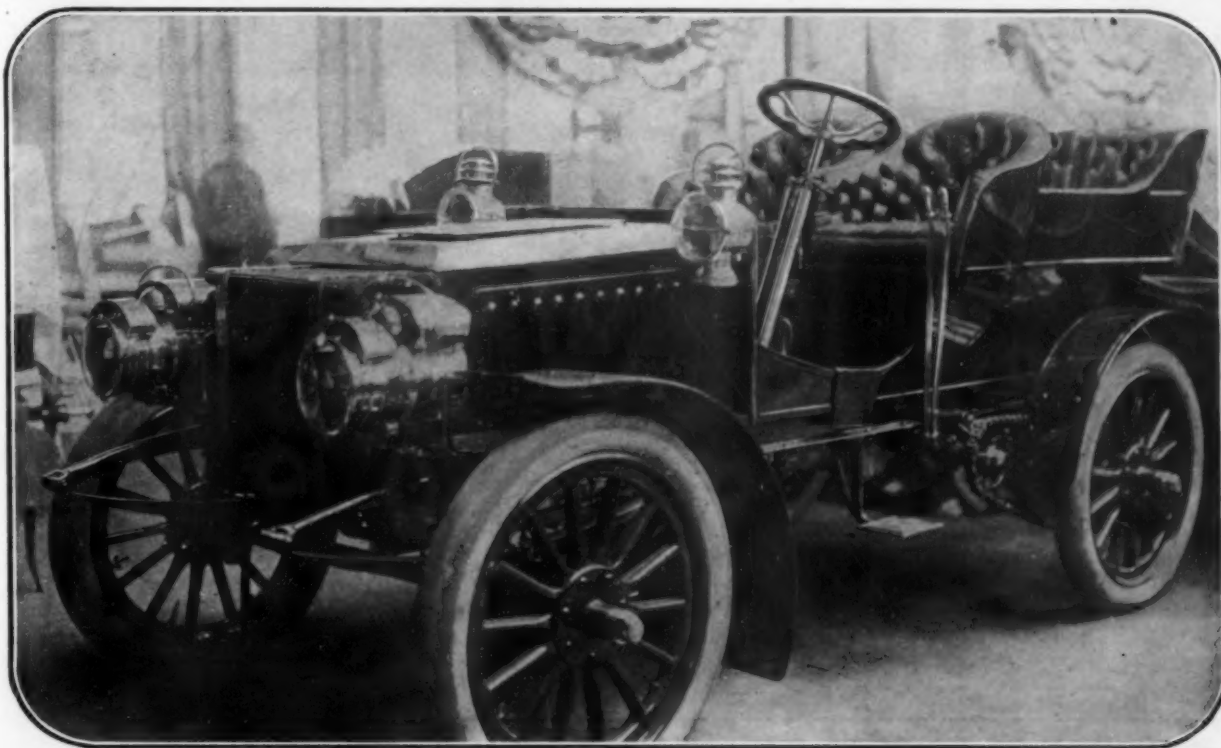
SAFETY OF THE PUBLIC IS ASSURED.

It is easy enough to cry down racing and point to its dangers, and there is no doubt that the man who drives a powerful machine at 60 and 70 miles an hour over all kinds of roads carries his life in his hands; but after all, this is a matter that concerns the drivers themselves, who are fully prepared to take the consequences in the same way as the man who goes down in a submarine boat or pilots a navigable balloon. No progress can be made without risk, and if the safety of the public is assured no one has a right to complain. The Government has naturally been solely concerned for the security of the public, and finding that the Paris-Vienna race went off without accident to anybody but the drivers themselves, it seemed inclined to give a freer hand to organizers in the future, subject to their

Automobile circles here are somewhat alarmed by the refusal to sanction the holding of the circular race for the Pioule Cup, which was to have been run off in the south of France next month. The promoting club merely announces that the permission has been refused without saying by whom this has been done, and it is therefore difficult to ascertain whether the race has been vetoed by the prefect or by the Minister. In the former case it may not have much significance, but if the Government has forbidden the race the outlook is more serious, since it implies that the program of the present year is likely to be considerably shortened.

PAU RACES IN DOUBT.

A week or two ago there were rumors that the organizers of the Pau meeting had been informed that they would also fail to get permission to run off their an-



UPTON GEAR COMPANY'S TOURING CAR, COPIED FROM THE PANHARD.

able surprises as those which marked the opening of the season a year ago. The trade has firmly impressed upon the Government, the prefects, the under-prefects, mayors and the host of other "functionaries" who consider themselves indispensable to the proper working of the law that the national industry, whose praises they are always ready to sing, can only be satisfactorily developed by racing. The speed tests have taught makers a great many valuable lessons concerning the designing and construction of cars to meet the enormous strains to which they are subjected, and not only have these resulted in improvements that would not have been possible otherwise, but the races have proven one of the most important factors in the spread of automobilism.

getting the consent of the local authorities.

POLITICS INFLUENCES DECISIONS.

Unfortunately, as the Government has to cut its coat according to the changes in the political situation it is never safe to count on its support, the more so as the Minister of the Interior has never committed himself to any definite promise, and has merely tolerated the organization of races which may be suppressed at any moment. The matter rests very largely with the departmental prefects. If they give their consent it is usually sanctioned by the Minister unless he finds it a matter of political expediency to put his veto on certain races.

It is by no means certain whether this is not the case at the present moment.

nual event. The Pau meeting, which precedes that of Nice, is practically the opening event of the year, and is always a very popular and successful one. Last year the opposition of the Government to racing was so manifest that the organizers thought it prudent not to ask permission, and it really seems as if we shall be deprived of the race again this spring. It is, however, too early to speak definitely on this point. Judging from appearances the Government will limit its sanction to a few big events, such as the Paris-Madrid race, and suppress the other meetings which it regards as of a purely sporting character, without much value from an industrial point of view. The next month or two will show whether we are right.

One of the Paris newspapers has just

come out with an announcement that arrangements are being made for an automobile race round the world in 1904 or the following year, and it publishes details which show that it has either been hoaxed or that the author of the article has not yet fully recovered from the effects of the New Year's festivities. It may be prophetic of what will happen a century hence, when we have got nice automobile roads through Russia and Siberia, and automobile manufacturers have made such huge fortunes in the business that they can allow themselves to indulge in such eccentricities, but before racing round the world the cars have to go from Paris to St. Petersburg and, perhaps, in the dim

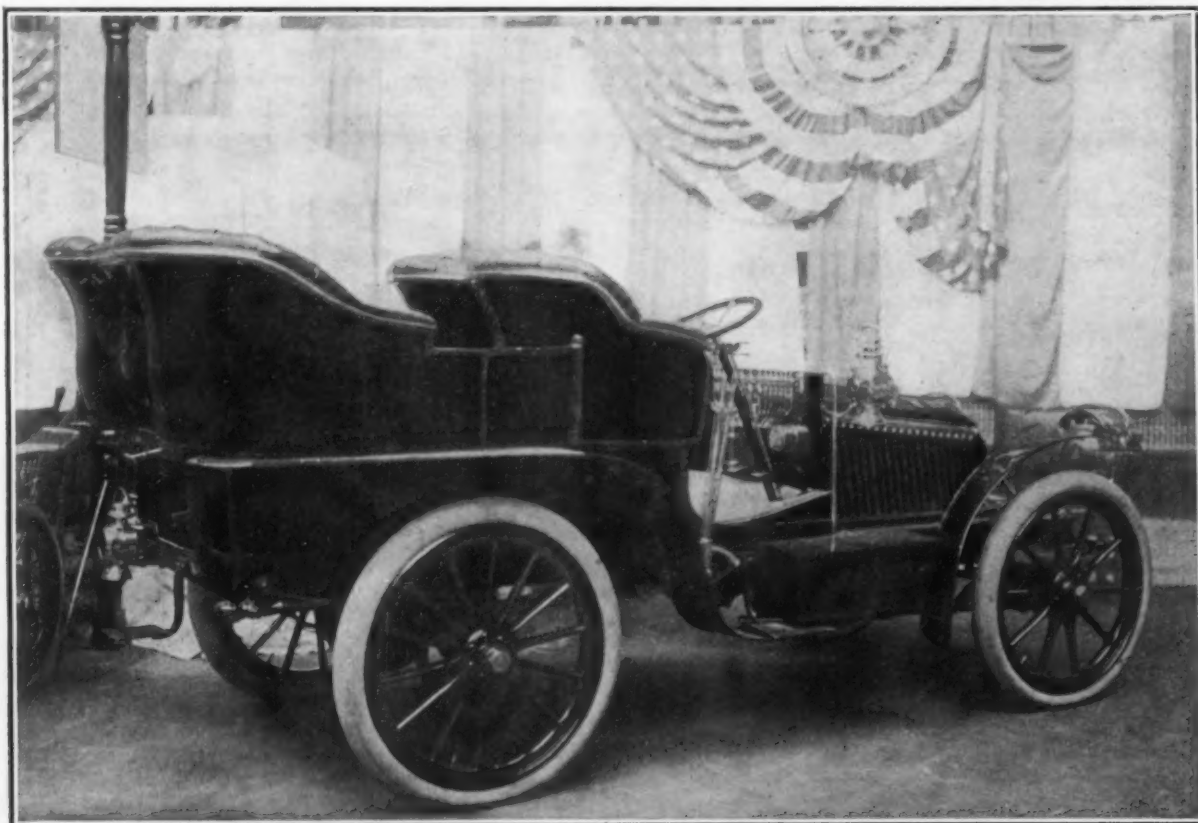
level best to put things right, while the travelers are trying to find the ways and means of returning home. Such a journey is very expensive, and—well, the would-be automobile globe girdlers do not seem to have had unlimited funds at their disposal.

ENGLISH TRADESMEN AGITATED OVER VAN TRIALS.

Staff Correspondence.

LONDON, Jan. 9.—Considerable feeling is being evinced against the Automobile Club by the chief trade association, the Society of Motor Manufacturers and Traders, which has already become a very powerful association and is still growing

listen to them. A committee of the society has been formed for the purpose of drafting a model set of rules, regulations and conditions under which they will enter vehicles for these trials. Of course they are open to compromise in detail, but the society which includes practically all the people who are likely to enter vans for the test, will stand by the general spirit of the code they will issue. To make these trials equable to all, the vans competing is a matter fraught with the greatest difficulties. So far as has already been made known by the club, it is proposed to allot the entered vans to the various large stores and carrying firms, whose work must of necessity vary in a large degree. The idea



WARD LEONARD TOURING CAR, COPIED AFTER THE RENAULT.

and distant future on to Pekin. For the moment they find that a race to Vienna is quite as much as the cars and the drivers can stand.

GLOBE TROTTERS IN TROUBLE.

Meanwhile, those globe-girdling enthusiasts, Dr. Lehweß and Herr Max Cudell, have given up their trip round the world. They took a couple of months to go from Paris to Warsaw, and then they got to St. Petersburg and finally to Moscow. Then the water froze in the motor jackets, bursting two of the cylinders, and the big vehicle traveled with half its power on towards Nijni Novgorod. It has not succeeded in reaching the town celebrated for its fair, and the latest advices state that the *Passe-Partout* has been abandoned to the mechanic who is doing his

in influence and strength. The society appears to be of opinion that in the matter of long and exhaustive trials the club does not sufficiently consider the huge expenditure of time and money which such competitions cost the trade as a whole. Moreover, it is felt that the rules of such competitions have been so drawn and administered in the past as to exert a particularly unfortunate effect upon the businesses of houses known to build the best carriages, but who have lost points and prestige by trivial happenings or misconception of duty by unintelligent observers. The society feels that the club must more nearly approach the trade in getting out schemes of trials, and in view of the proposed van trials which are to be held early in 1904, they intend that the club shall

in promoting the trials is to convince traders of the superiority of self-propelled over horse-drawn traffic for the delivery of goods in the transaction of their several businesses, and the difficulties in equalizing work in such relation is obvious. How such equalization is to be achieved is the problem that lies before the committee of the Society of Motor Manufacturers and Traders.

AGENCY FOR BELGIAN CARS.

New agencies for foreign built cars are continually being taken up here. The last make to appear on the English market is the Pipe car, built in Belgium. The London Motor Garage Co. has bought the whole season's output of the Belgian house, and will deal with the vehicles both on the Continent and in this country. I went

over this car when in Paris, and if all the vehicles turned out are to be up to the standard of those shown at the Grand Palais, then we shall be the richer by another splendidly built car at a reasonable price.

ENGLAND ABANDONS HOPE OF GORDON-BENNETT RACE MEET.

Staff Correspondence.

LONDON, Jan. 9.—Whatever may be said or inferred to the contrary, it is not all likely that the Gordon-Bennett race will take place within the confines of the United Kingdom. It is almost certain that no automobile course of the requisite length can be discovered. That our sprightly neighbors on the other side of Channel are of this opinion is evident from the assured manner in which they are discussing the Gordon-Bennett race in connection with the Paris-Madrid event. Apart altogether from the argument so frequently heard here now, to wit, that as the French sent the Gordon-Bennett competitors over the awful ascent and descent of the Arlberg, we need have no qualms in despatching them in turn over a "a rocky road to Dublin," it will not be for the best, seeing the greatly increased speeds at which the event will be run that the event should not be fought out over the best and fastest course obtainable. It is clear the French club will not give away in one jot or tittle to ensure the return of the race to the roads of France.

Germany will make a very determined effort to get possession of the cup. I am advised that at Stuttgart a Mercedes car has been constructed specially for entry in this great event, which is fitted with engines of 100 nominal horse power. The car is more than 10 feet in length and the driver's seat is right back over the rear axle. For this reason the steering standard is so inclined that the wheel is vertical. The car is expected to be capable of a sustained speed of 100 miles an hour on the road.

Would Tax Autos for Roads.

SYRACUSE, Jan. 19.—The good roads committee of the Onondaga County Board of Supervisors will attend the Good Roads Congress at Albany on Tuesday and present a number of practical ideas. Two propositions are to be made: first, that all penitentiary prisoners of the state be employed as road repairers, and, second, that a general tax be levied on automobiles. The plan of taxing automobiles came from the Syracuse Automobile Club, members of which gave it as their opinion that automobilists throughout the state would willingly give \$5 or \$10 each a year for the sake of good roads. The employment of convicts is urged, because every county supports in idleness many men who might better be engaged in work that does not come in competition directly with honest labor.

MAGNITUDE OF AUTO INDUSTRY IN FRANCE.

BARON ROTHSCHILD GIVES FACTS.

More Than Fifty Firms and 45,000 Skilled Mechanics Engaged in the Construction of Motor Cars—Motoring for Health—Meeting is Called to Promote Motor Cycle Trials.

Staff Correspondence.

LONDON, Jan. 9.—Just now there comes a lull in matters automobile, but it is the lull before the storm of exhibition. On Friday next there opens at Earl's Court, the Motor Show, promoted by the Stanley Cycling Club, who, ill-content with the great success of their cycling show, year by year, are like Oliver, asking for more, and to use a mixed metaphor, seem like riding for a fall. A list of exhibitors has been shown to me, and when the non-motoring standholders are eliminated but sixty remain, and of these at least three-quarters are practically unknown. This it is to be hoped will be the first and last Automobile Show to be promoted at Earl's Court by a club, without any sort of mandate from the manufacturers of the trade.

AUTO CLUB DINNER.

Last night the Automobile Club of Great Britain and Ireland opened their winter social season in the new club house, at 119 Piccadilly, by a house dinner, and a paper read by Baron Henri de Rothschild, entitled "Sept Ans d'Automobilisme—Tourisme et Construction," before a fairly numerous audience. Baron Henri was one of the pioneers of automobilism in France, and is at present in the trade, but upon somewhat unique lines. Like the rest of the members of his great family, he is of course immensely wealthy, but he is a Doctor of Medicine, and has established a hospital of his own in Paris called the Institut Pascal, after Zola's novel. This he has done out of the kindness of his heart, and in the running of his House of Mercy, he has sought to make his other hobby, automobilism, assist in the support of his charitable work. Accordingly he has started in the automobile business with a car called the "Pascal," built on the latest lines and sold at a reasonable profit, which profit goes to swell the funds of the Pascal Hospital.

I don't know whether this manner of doing business quite appeals to American ideas, I must admit it does not do so as far as I am concerned, for it appears to me that Baron Henri might very well run his hospital without becoming a competitor in trade with people whose daily business is trade. However that is neither here nor there. Baron Henri appeared before the British Club, read his paper, and was well received. I am bound to say that the paper did not warrant its title, for although the Baron was quite interesting and humorous for quite an hour and a half, he said little

about touring and absolutely nothing about construction.

It was with some surprise that the audience learnt that much detail built into what are now known as the "Mercedes" cars, is the fruit of the advice of the Baron, who in 1901, and since, has paid many visits to Stuttgart, in relation to vehicles ordered by him. Some figures given by the Baron with regard to the progress of the French automobile trade are, however, full of interest.

FRENCH EXPORTS AND IMPORTS.

The value of exports into France were, for the periods mentioned, as follows:

1900	\$75,000
1901	\$100,000
For 10 months of 1902	\$155,000

On the other hand the exports of automobiles were as follows:

1900	\$1,451,800
1901	\$2,680,000
1902	\$5,310,000

As these vehicles are recorded and valued by weight at about \$2 per kilogramme—2.22 pounds, the gross amounts are far from being the actual sums obtained by the French industry and trade in the export of automobiles all over the world. For instance it puts the value of a car weighing 500 kilogrammes, or roughly 1,000 lbs., at the lower figure of \$1,000, whereas it is well known the prices have ruled up to double that amount and are even now much above it.

There are no less than 53 firms engaged in the construction of automobiles in France, employing at least 45,000 skilled men, and with the allied industries, such as tire and spring making, etc., the Baron estimates that the automobile industry provides employment in France for no less than 180,000 men, earning an average wage of \$360 per annum. So he claimed it might truly be said that automobile construction had become a national industry in France. This he ascribed almost entirely to the latitude permitted by the authorities in the matter of racing, and gave it as his opinion that to racing and nothing else the position of automobilism to-day in France was due. This is testimony which the powers that be, both on your side of the Atlantic and ours, might take into close consideration. Maybe yours will, and you will profit, the obtuseness, obstinacy, and prejudice of years are, I fear, too strong in those set over us for any benefit to accrue to us from the loudest citation of Baron Henri's startling figures.

RIVALRY OF CONSTRUCTORS.

The Baron pointed out that the striving for pride of place by the constructors had urged them to efforts which they never would have made for the private owner, and the astonishing automobile which weighed less than 2,200 pounds, and would travel, as did René de Knyff's Panhard, between Paris and Belfort, in the first stage of the Gordon-Bennett race, at 77 miles

per hour. Baron Henri then spoke on the hygiene of automobilism, from the standpoint of a medical man.

He gave it as his opinion that drives should not be maintained for more than 2 hours in the morning and 3 hours in the afternoon, and then only so long as seven hours sleep was enjoyed. If drives were taken on cars which ran at speeds above 30 miles an hour not more than 3 hours a day should be spent on the vehicle. If automobilism were indulged in to excess, lung troubles, rheumatism, nervous ailments and insomnia were likely to result. On the other hand, if wisely taken, he had found it act as an excellent tonic and had known some wonderful cures of neurasthenia to result therefrom.

In reply to a question from a member as to the probable speeds of steam, petrol and electric cars in the future, Baron Henri expressed his opinion that however speedy cars propelled by either agent were built, the humanity stop came in as to driving on the road.

SPEED ON HIGHWAYS.

Upon what had been told him by his friend, the Chevalier René de Knyff, he was of opinion that no matter how straight and good the road, when speed approached 100 miles per hour, the limit of human control on ordinary roads was reached, and about 98 miles per hour he thought was not likely to be exceeded. So great a speed as this also could only be maintained for a short space of time. M. Serpollet had shown him a steam car in building with which, on the Promenade des Anglais, at Nice, next April, he hoped to cover a kilometer—.621 of a mile, at a speed of 100 miles an hour. Having achieved this, he (Serpollet) would rest on his oars and would build no more speed cars.

Of electric vehicles for touring and country use, the Baron did not speak over hopefully. Before electric cars could hope to come near petrol and steam for such uses, discovery and not invention was required in connection with the accumulators. The paper was excellently received throughout.

MOTOR CYCLE TRIALS.

On Monday next the Trade and the Club meet to discuss the advisability and manner of holding a trial of motor cycles. Hitherto motor cycles have been sandwiched into the trials of cars, with but little satisfaction to either the riders or the manufacturers of the cycles. Owing to their speed and the fact that they cannot carry observers, motor cycle trials are somewhat difficult of arrangement, if they are to be run on the roads, while if held on a track, the value of the test as a trial of road machines is very largely discounted. Motor cycling is gradually obtaining a good hold in this country, and there is no doubt that if properly conducted, public trials would very largely assist the boom.

Paris Show from English View—III.

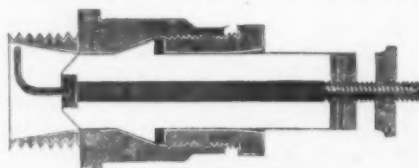
Description of the Ader Automobiles by the London Staff Correspondent—New French Spark Plug.

LONDON, Jan 9.—After the multitude of slavish imitations of the German model at the recent Paris show, it was a relief to turn to the Automobiles "Ader," which were exhibited by the manufacturers, the Societe Industrielle des Téléphones. The new car shown was fitted with an engine of four cylinders, constructed on similar principles to other four cylinder engines, but so disposed and balanced that they

being set at 90 degrees, the balancing is very complete.

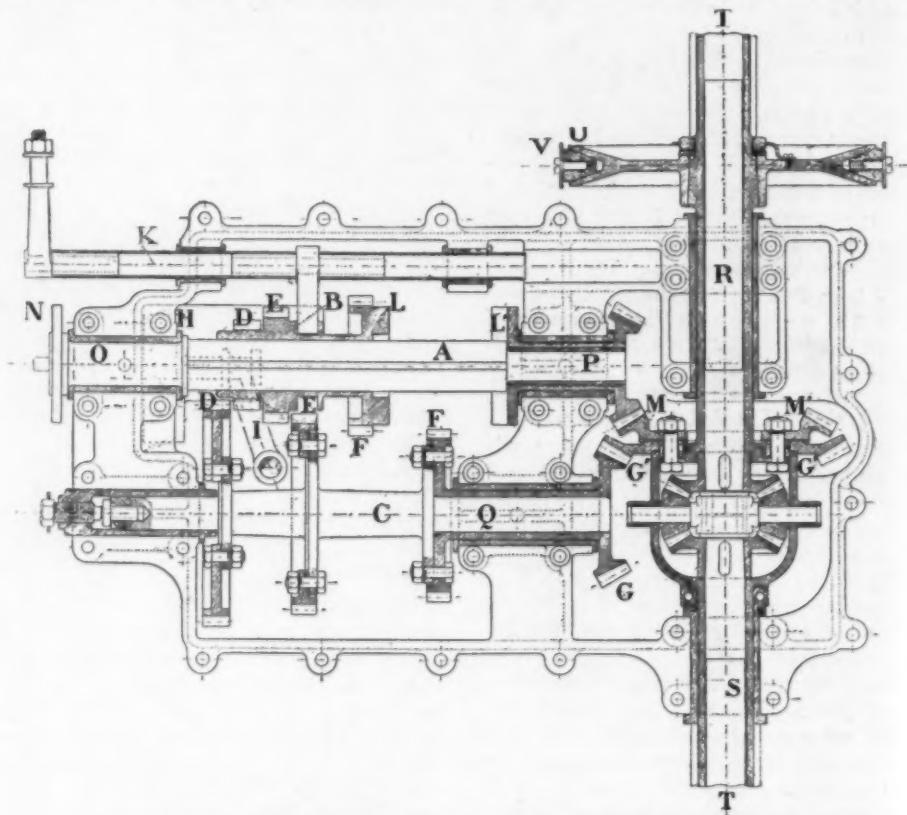
SPECIAL CHANGE SPEED GEAR.

The valve and ignition and pump actuation calls for no special remark, but the change speed gear, of which I give a diagram below, is worthy of attention. In addition to special design, it will be remarked that very long journals are employed. The speeds are changed as usual from the first to the third speed by sliding the sleeve, B, on the squared portion of the primary gear shaft, A, so that the pairs of toothed wheels, D, E and F, on the sleeve, are sequentially brought into mesh with the wheels, D', E' and F', on the secondary gear shaft, C. Whichever of these pairs of toothed wheels are in mesh, it will be seen that the drive passes from the secondary gear shaft, C, to the differential shaft, I I, through the bevel toothed wheels, G G'. But when the fourth speed is desired the sliding sleeve, B, is moved to the right on the primary gear shaft, A, until the positive or jaw clutch, L, on the right hand side face of the third speed driving pinion, F, is engaged with the jaw



"BOUGIE E" FRENCH PLUG.

give little or no vibration. The cylinders are placed in pairs longitudinally of the car at an angle of 45 degrees with and above the horizontal plane, and the planes in which the centers of each pair of cylinders lie at an angle of 90 degrees with each other. The explosions in the cylinders, numbering the latter from the front, are 1 and 4 and 3 and 2, and the cranks



DETAILS OF CONSTRUCTION OF ADER CHANGE SPEED GEAR.

A, Primary gear shaft. B, Sliding gear wheel sleeve. C, Secondary gear shaft. DD', Pair wheels giving first speed. EE', Pair wheels giving second speed. FF', Pair wheels giving third speed. GG', Bevel toothed gear driving differential gear shaft T on first and second speeds. H, Reverse pinion. I, Reverse lever fork. K, Change speed gear striking rod. LL', Mechanical or positive clutches for direct drive on third speed. MM', Bevel toothed gear driving differential shaft T on fourth speed. N, Coupling for attachment of clutch shaft. O, P, Q, R, S, Automatically lubricated bearings. T, Differential shaft. U, Brake drum or T. V, V-shaped brake band.

clutch, L^1 , on the left end of the sleeve carrying the bevel pinion, M . When these positive clutches are in engagement, the pinion, F , is clear to the right of the toothed wheel, F^1 , and the drive passes directly from the primary gear shaft, A , to the differential shaft, $I I$, through the bevel gear, $M M^1$. The bevel gear, $G G^1$ connecting the secondary gear shaft, C , with the differential, is always in mesh, but when the positive clutches, $L L^1$, are in, runs idle, as may be seen. It is obvious that this direct drive on the fourth makes for considerable saving in transmission, and though not yet adopted by Messrs. Panhard & Levassor, who, until lately

anything possessing a semblance of novelty to which I really need to draw attention. Of novel designs of sparking plugs there were few indeed. French ingenuity appears to have exhausted itself in this particular, but I came across one which seems to have meritorious features. It is termed the "Bougie B," and is made as shown in the accompanying section. The black central core is the conducting wire, surrounded by a short, thick tube of porcelain conically finished at the end, and subtended within the cylinder walls by the threaded portion of the metallic part of the plug. It is claimed that the sort of pot end in which the sparking is done pre-

Public Service Cabs in Berlin.

It is reported from Berlin that public motor cabs have been withdrawn from service on account of the high cost of operation, but this report is corrected by *Die Radwelt*, which states that only two small firms, owners of not more than a score of motor cabs, have discontinued the service, and not so much on account of the cost of operation as by reason of the exorbitant license fees demanded of them. The low tariff also had something to do with the withdrawal. Being forbidden to charge higher rates per hour than the taximeter cabs, they were at a disadvantage because the motor cabs cov-



ADER CHASSIS AND COMPLETE CARS EXHIBITED AT PARIS SALON BY SOCIETE INDUSTRIELLE DES TELEPHONES.

were presumed to set the fashion to the world, has been taken up by most of the other leading firms, not excepting Mors.

The Societe Industrielle des Téléphones leave the flywheel of their engine alone, and mount driving and driver portions of the friction clutch on a separate clutch shaft, as is done, though somewhat differently, by those particularly advanced people, Messrs. Chenard & Walcker.

A NOVELTY IN SPARK PLUGS.

Glancing on through the errant notes I made as I wandered round that fine show, I do not find that there is much more of

vents carbonization of the sparking points, while the shape and method of holding the porcelain insulator within the plug obviates fracture of the former by heat and consequent shorts.

The French show offered absolutely nothing new in tires, the most remarkable feature being the mounting of a huge squarish and fluted tread on the Michelin tires, which, it is claimed, militates considerably against side slip. I saw many cars bringing visitors to the show, fitted with these tires, and the drivers who I addressed on the subject spoke very well of them.

ered considerably greater distances in a given time.

Foreign Notes.

Emperor William's plans for transforming the Grunewald Forest into a great public park include the construction of an automobile speedway seven and a half miles long and sixty-three feet wide.

The *Auto-Vélo*, of Paris, has been enjoined by the final court of appeals from using the word "Vélo" in its title, the decision sustaining a previous verdict in a lower court obtained by *Le Vélo*, the older daily automobile and sports journal.

Expert Discussion of the Oil-Engine Automobiles of 1902*—VI.

BY CAPT. C. C. LONGRIDGE.

MUFFLERS OR SILENCERS.

Until very recently these have been considered merely as sound-deadeners, and their influence on engine power quite overlooked. Many of the silencers used were thus ridiculously small, giving rise to quite unnecessary back pressure. What is the proper volume ratio between the silencer and the cylinder the author does not know. W. A. Norris states that it should be a minimum of 5 to 1. The point could be easily settled by any manufacturer that would take the trouble to make the simple experiment. That silencers are probably yet too small, and that considerable throttling still exists, is evident from the fact that certain American makers, (e.g., the Friedman car, the Murray car) have added to the exhaust pipe between the cylinder and silencer a bye-pass valve to free the exhaust when more power is required. This method has been followed in the English Brooke car, Fig. 3 (Jan. 3), and the Daimler Mercedes Simplex. In the American Friedman car the silencer consists of concentric tubes, communicating with one another through perforations. The exhaust from each cylinder enters at opposite ends of the central tube, and diffuses outwards. The silencing effect is said to be very complete.

To ensure immunity from fracture in case of back-fire, a relief valve is sometimes fitted to the muffler.

COMMUNICATION OF MOTIVE POWER.

Crank and crank-shaft.—As regards the position of Otto-cycle motor crankshafts, the practice is to set the center of shaft below the axis of the cylinder. The method is open to objections. All Otto-cycle motors are single-acting, high-speed engines of accentuated type, in as far as the initial pressure is greater, more violently applied, and more rapidly repeated—constantly in one direction, namely, on the downward stroke. This sudden blow, always applied in the same direction, throws a heavy strain on the connecting rod and crank-shaft, and, in large power gas-engines, necessitates crankshafts of about half the diameter of the cylinder. This is one of the mechanically weak points of all engines using the Otto cycle. The question is whether the present practice deals in the best way with this defect. The prevailing method of locating the shaft line so as to intersect the cylinder axis gives equal angularity to the connecting rod on its up and down stroke. The cycle, however, imposes all the work-

ing strain during the down stroke; consequently, construction should, perhaps, aim at keeping the connecting rod in the most favorable position to withstand pressure in this period of the cycle. In other words, the angularity should be reduced during the working stroke, being proportionately increased for the idle strokes; less angularity when the pressure is great, more angularity when it is slight. An additional advantage is that the crosshead is kept constantly pressed against one guide, if the shaft is half stroke away from the axis of the cylinders, consequently there is no knock from bar to bar on turning center. All that is needed to accomplish this is to set the crank-shaft in advance of the axis of the cylinder. This, as regards motors, excepting in the Duryea car, would be a new departure; but it is not unknown in the modern, single-acting, high-speed steam-engine; and the reasons for its use in the latter are certainly more cogent in the case of the former. In steam practice the Peache high-speed engine, made by Davey, Paxman and Co.,¹ and the Westinghouse single-acting engine might be cited as instances of this method of construction—a method which motor manufacturers might do well to copy.

CRANK AND CRANK-SHAFT.

On the question of material for crankshafts, one of the prominent firms in this country informed the author that the steel from which they forged motor-cranks averaged 32.5 tons per square inch tensile strength, that is to say, not below 30 tons nor above 35 tons. Phosphorus 0.05. They consider this steel less liable to fracture as a result of constant vibrations, shocks and jars. The author does not at all agree with this view. He believes that for small crankshafts (also connecting rods, etc.) a more rigid steel, of very much higher tensile strength, at least 45-50 tons, with even lower phosphorus, is a far more suitable material. A milder steel

¹Extract from letter of Messrs. Davey, Paxman & Co., June 23, 1902: "The shaft in our Peache engine is put out of line for the reason you describe, as the engine is single acting, and we do not expect to abandon the practice even for large engines. At present the biggest Peache engine is 800 I. H. P. and 200 revolutions per minute. No doubt the position is theoretically correct, and practically the plan works well." In *The Autocar* (July 19) the Duryea Co. wrote: "This method of construction has been in use upon Duryea power carriages for the last three years and has borne out expectations to an extent which will perhaps be better understood when we say that, although the crank shafts of a 10-horse power engine weigh barely 14 lbs., we have yet to hear of a broken one, and there are some hundreds in use."

retreats before impact, yields and deflects, and it is this repeated deformation that does the damage. This is especially the case where, as in high speed, single-acting explosion engines, the stresses of torsion and bending are so quickly and frequently repeated and reversed. The elastic limit and ultimate tenacity of these higher tensile steels is very much higher than those of milder quality, and as they are rigid and unyielding, there is no deflection to add to the strain of the metal, and to wear down the inner sides of the bearings, and thus aggravate the bending tendency. For these small forgings, steel of higher tensile strength is easily obtainable with equal safety, and should be specified by motor makers. For such purposes nickel steel has many claims to consideration.²

THE FLY-WHEEL.

There is little to be said on this detail. The inertia of the fly-wheel is one of the chief causes of vibration, the explosion energy imparted to the wheel reacting on the frame. A very radical elimination of this objectionable feature is the provision of two fly-wheels revolving in opposite directions. This method has been successfully worked out in the English Lanchester car, and also in the French Crozet (Tourand) motor. A large, more especially large rimmed, and, therefore, preferably a built-up fly-wheel, is by no means to be despised, since it conduces to steady running; facilitates easy change from low to high gear; helps starting on hills and heavy ground; extends the speed range, enabling the motor to run slower without pulling up; reduces fluctuations of rotative speed, and thus the stresses on all driven parts, gear, chains, and tires. Naturally multiple cylinder or high-speed, or low-compression motors, require less fly-wheel than single-cylinder, slow-running or high-compression engines.

FRICTION CLUTCH.

The function of the friction clutch is to transmit motion from the fly-wheel to the gear. A good deal of trouble used to be experienced with clutches getting out of alignment, slipping, acting too fiercely, etc. Nowadays these difficulties have mostly

²In reply to the author's inquiry on this point, Colonel Holden, R.A., wrote: "I personally should prefer steel with a much higher tensile strength," while Captain Chankey, R.E., replied: "For small engines in which lightness is of paramount importance and there is no difficulty in getting the amount of bearing surface, high tensile steel is, I think, the best so long as it also has sufficient elongation and contraction of area. Nickel steel seems to be the kind of steel to use in such a case." For machinery parts subject to alternating stresses and wearing action, H. F. J. Porter, of the Bethlehem Steel Co., is said to recommend steel of 85,000 lbs. tensile strength, 40,000 elastic limit, 15 per cent. elongation in 4 diameters; or, after tempering, 90,000 tensile strength, 45,000 to 55,000 lbs. elastic limit, and 15 to 20 per cent. elongation. By introducing 3 per cent. nickel, the quality is raised.

*From a paper read before the Institution of Mechanical Engineers in London, England.

disappeared. One of the best methods of insuring accurate alignment is to mount the internal part of the clutch on the engine shaft, prolonged through the fly-wheel, as in the 8 horse power Hozier car. In the 16 horse power Panhard chassis, recently shown at the Crystal Palace Exhibition, the clutch was mounted on a sort of Cardan joint, allowing a certain vertical and lateral motion—also a good way to obtain regular engagement all round. In other cases, provision against defective alignment is made by setting springs under the friction strip (leather, copper, etc.) with which the clutch is faced.

In all cases clutches are pressed against the recessed fly-wheel by a spring, usually spiral. In the best practice, the thrust of the spring is regulated by an adjustable nut, etc., and is prevented from reaching the engine bearings by the interposition of a ball thrust bearing, as in the Daimler, Mors, and other cars.

In most cars the application of the foot-brake withdraws the clutch; and, in the Mercedes Simplex or the Canstatt Daimler, the withdrawal of the clutch automatically reduces the speed of the motor—a very neat arrangement.

The latest form of clutch is that employed on the German 40 horse-power Mercedes-Simplex car, Fig. 1. Here the ordinary clutch is replaced by a spiral spring fastened at one end to the fly-wheel, which in this case serves as fan. When in action the spring is caused to coil tightly round a small drum on the driving axle. The idea is in many respects excellent.

TRANSMISSION FROM CLUTCH TO GEAR.

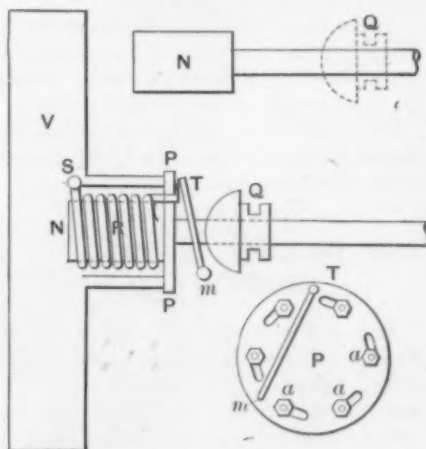
The main point noticed is the increased use of universal joints at both ends of the transmission shaft, so as to prevent deflection strains reaching the gear. In the French 8 horse power Clement car, behind the spring adjusting nut, the clutch-shaft ends in a squared section, the faces being given a slight longitudinal curvature to allow for deformation of the frame. The clutch-shaft and change-gear shaft are united by a sleeve, inside of which is a distance piece. By opening the coupling sleeve and removing the distance piece, the clutch and shaft can be removed; this is a very happy device. The English Daimler, and, presumably, most other companies, have very similar methods.

There is an indication, however, that these universal joints will be dispensed with, and greater rigidity obtained by tying all parts to a single frame. There is no objection to a single frame properly tied, but flexibility of drive, the author thinks, should be fully maintained, if not increased. To this end he suggests the trial of flexible transmission shafts, constructed on methods, illustrated by the coiled spring, the bundle of steel rods, etc. Such shafts provide not only for want of alignment, but also, by reason of their in-

ital twisting, absorb the heavy jars and strains when the clutch is too fierce or too suddenly applied. The same method of construction might perhaps be applied to the countershaft between the differential and the sprocket pinions.

CHANGE SPEED GEAR.

The various systems in use do not present much novelty. Four methods predominate: toothed wheels which are slid in and out of gear, the Panhard type, very generally used; gear-wheels^a always in mesh, but fixed, when required to drive, by interior expanding clutches, used, for example, by the Société des Automobiles Crouan, Paris, less common, but likely to become a great deal more so; belt-gear, as in the Benz cars, fast disappearing; epicyclic gear, running solid for the high speed, found chiefly in light cars; lastly a link motion, by which varying throw is imparted to rods which drive the differ-



MERCEDES COIL-SPRING CLUTCH.

ential, on the rear axle, through reciprocating clutches. Only one instance of the use of this method is known to the author, viz., in the 2 1-2-ton lorries, built by R. Hagen, of Cologne.

With gears the general tendency is a direct drive for the highest speed; that is, without the use of intermediate pinions between the motor and the differential. The Mors car may serve as illustration of the method. At the end of the primary and secondary shafts there is the usual bevel pinion gearing into and driving the differential; this is in use for the first three speeds. The fourth speed is transmitted direct from the primary or driving shaft (that next to the motor) to the differential through a spur wheel, out of gear, for the first three speeds. Actuation is by a lever that, forcing back the driving shaft, leaves the intermediate shaft out of gear and engages the loose spur wheel with the differential.

An ingenious idea has been realized by L. Megy, of Paris. Dispensing with the hand change-speed lever, he causes the

^aDouble helical, or fishbone, gearing is the least noisy.

speed to automatically vary according to the resistance to be overcome. The gear-wheels are always in mesh, and on each of the loose wheels is a large collar or drum, inside of which is a leather disk. These disks are operated by a rod inside the shaft and are displaced by the resistance met with by the car. Thus, when the car begins to slow down on one gear the rod moves forward and presses the leather disk on a lower speed wheel, and vice versa. Any one speed, however, can be fixed by a hand lever. The car thus regulates its speed to the road, or can be regulated when required.

It is quite possible that change-speed gears may be soon driven out of the market either by motors of sufficient flexibility or by some electric transmission of power from the motor to the driving-wheels. Or, though far less likely, by hydraulic gear. It is rather a sign of the times that Messrs. Panhard and Levassor should, it is stated, have taken over the Canstatt-Daimler and Lohne-Porsche French patents for a system in which the motor drives a dynamo, and this an electric motor on the wheels. A number of cars of this nature are, it is said, proving satisfactory.

DIFFERENTIAL GEAR.

In a few cases the differential has been replaced by other arrangements. Messrs. Brouhot et Cie., of France are said to employ ratchet clutches inside the hubs of the driving wheels. In taking corners, the outside wheel runs free, and on dropping down again to the same speed as the inside wheel, the ratchet pawl falls into the teeth for forward driving.

In the Swift voiturette also the road wheels are fitted with free-wheel clutches of the ratchet type, such, only on a larger scale, as are in use on bicycles.

Neither arrangement would appear suitable for reversing.⁴

In designing a differential, the pins should be of the strongest material and ample proportions, and every precaution should be taken to keep the gear free from any defect in the countershaft alignment. Universal joints in the latter can be used, and the flexible shaft as suggested might be tried.

The weakness of the divided shaft is remedied in "the liner tube countershaft," or may be got over by placing the differential on the road wheel axle.

The defects of bevel differential gear are: Natural tendency of bevel gear to force itself apart, end thrust of the pinions against the collars, excessive wear and tear, cross strain on the bearings, loss

⁴Patent No. 21,675 96/100, C. M. Johnson, describes another substitute for the differential. The axle of the driving wheels is fitted with two friction clutches, one for each wheel. These clutches are connected by chains or equivalents to the fore wheels or axle in such way that as one chain is tightened on a curve the respective clutch is released and the wheel is free to revolve apart from the motor.

of power by conversion at right angles. The same compensation is obtained by spur differential without the thrust and wear.

SYSTEMS OF DRIVING.

The two systems of driving are the live axle and the double sprocket chain. The former seems the better mechanical job, but so far it is chiefly confined to light cars. A notable exception is the 40 horse power Napier, on which Mr. Edge has recently won the Gordon-Bennett Cup. No development of the central chain drive has taken place.

It is difficult to understand why sprocket chains are left quite uncovered and usually without lubrication. Both could be easily effected.

STEERING.

All first-class cars are fitted with irreversible steering gear, mostly of the worm and worm-wheel section, or preferably the square thread shank and sleeve or nut on account of the reduced wear, which in the former arrangement may soon produce backlash.

In the future, efforts should be made to embody resilient or absorbent members in the locked or irreversible controls, which at present transmit in their full force all shocks and blows from the front wheels.

At the time of the Paris Exhibition, a tendency was displayed toward utilizing the steering pillar or column for other purposes as well. Thus in the light car of Messrs. Seug et Henry, Romilly-sur-Seine, the column had three movements. In the vertical position, it put the brakes on and gave the driver room to mount or dismount. Pulled down to the second notch, the brakes were off, but the motor was still out of gear. In the third notch, the usual position for steering, the motor was in gear. In the Megy French car, when the pillar was upright, the motor was out of gear; inclining the column to its steering position and pushing it down, put the motor in gear; an upward movement threw the motor out of gear and applied the brake; while a further upward motion reversed the gear. The column could be fixed in any one position. The American Duryea car is another instance of a manifold use of the steering pillar. The practice is not, so far, extending.

BRAKES.

Invention is still busy with this important detail of car construction, and

*Expanding ring brakes are more easily protected from dirt, damp and oil, which greatly affect the frictional properties and the wear of hand brakes.

*Brake power becomes effective at the tire surface, hence the greater the number of intervening parts, the greater the chance of brake failure. By direct application to gear, the latter is more severely taxed. Brake action on the differential is likely to cause skidding, if one wheel is on slippery ground; in any case the stopping power would be greatly reduced.

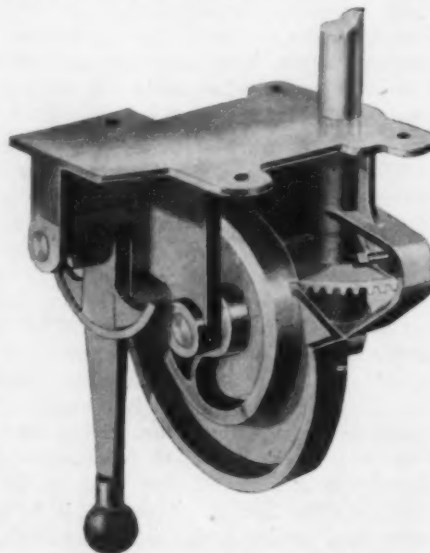
there is yet room for an improved brake, perhaps hydraulic, pneumatic or magnetic. Several makers are abandoning hand brakes on the driving wheels; and, in the author's opinion, the step is a wise one. The substitute mostly takes the form of an inside expanding brake acting on the inside of a special sprocket ring.⁵ Messrs. Charron, Girardot et Voigt have introduced an expanding collar inside a drum on the wheel. The Canstatt Daimler uses a powerfully built expansible ring clutch, acting within an annular flange, secured to the road wheel, as part of the sprocket. Messrs. James and Browne employ a double-acting brake, having two cast iron slippers acting on the inside faces of the sprockets. Another form of brake is the French Rassinier, which substitutes the grip of rollers (rolling friction) for blocks (sliding friction) on an annular ring affixed to the rear wheels. It is said to be impossible to fire the brake or affect its grip by grease.

The water-cooled hand-brake on the differential, and occasionally on the countershaft as well, shows no alteration. Neither of these positions are commendable.⁶

In almost every case operating the foot-brake withdraws the clutch and in some cases throttles the motor.

NEW PRINCIPLE IN THE I. C. M. STEERING CHECK.

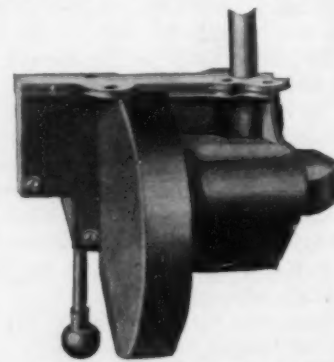
Not a few accidents to motorists have been caused directly by the steering lever or wheel being suddenly jerked out of the hand of the operator upon one of the front wheels coming into collision with an obstruction or depression in the road or street.



[SPIRAL STEERING CHECK UNCOVERED.]

A number of devices have been invented to prevent this, and several have been offered in the market. The latest of these is known as the I. M. C. steering check, and is shown in the accompanying illustration. It is bolted to the bed of the carriage

under the foot-board, with the spiral toward the rear of the vehicle and the upright shaft penetrating the floor. The bevel gear at the lower end of this steering shaft meshes with a bevel pinion on the end of the short shaft that carries the spiral disk and by which the disk is revolved. The spiral is an Archimedes spiral, the groove being of the same sectional dimensions along its entire length. A strong stud on the inner side of the depending ball-headed



STEERING CHECK ENCASED.

arm or lever fits exactly in this groove. The arm is journaled in the base casting as shown, and has a segment fitting against the face of the spiral to assist in preventing twisting action of the lever. The ball end of the depending arm is for connection to the rod that moves the steering knuckles of the vehicle. Obviously, any turning motion of the steering shaft rotates the spiral disk, and as this revolves in one direction or the other, the stud of the depending lever is moved to the right or left, forcing the arm with it and turning the steering knuckles.

Aside from its apparent simplicity and positiveness in action, this device possesses the merit of comparative cheapness of manufacture, has no lost motion or play, and is never in unlocked position. There is no dependence on automatic mechanism, and as the faces of the stud in the spiral groove stand always at right angles to the radii of the sides of the groove, no shock transmitted through the wheels, however severe, can affect the steering lever or hand wheel.

The operative parts of the check are entirely enclosed in an aluminum case to prevent pebbles and dirt from collecting in the groove or in the bearings.

This check was invented by Elwin L. Smith, of Boston, who has had one in practical use for nearly a year. He has placed orders for the manufacture of 100 or them, which he expects to have finished in the spring. He is having a new model made up for wheel steering with worm gear, the one illustrated herewith being for steering by lever or tiller.

The Neftel Automobile Co., of New York, has been incorporated at Albany with \$25,000 capital. The directors are William Hoey, Frank Sweeney and Knight Neftel, of New York.

Third Annual Madison Square Show.

Motor Cycles on Exhibition.

(Continued from Page 100.)

carrying a supply of lubricating oil. The vaporizer on the new model is a slight improvement on the one used last year. Provision has been made for a finer adjustment, and its action is practically automatic once the correct adjustment is obtained. One machine is shown.

The Merkel Mfg. Co., Milwaukee, Wis., exhibited one of its new machines at the stand of E. J. Willis, the New York agent for the Merkel. Here, too, the show visitors met with a pleasant surprise. The chief departures from the 1902 model are the adoption of the Regas spring frame attachment and the substitution of a flat belt of single thickness and one inch wide for the twisted rawhide belt used last year. The frame design has also been changed, and the motor is placed in a better position. The lower frame tube is "looped," and in this loop, just in front of the crank hanger, the motor is clamped, with its cylinder almost vertical. The exhaust from the motor is turned into the loop of the frame and is thoroughly muffled be-

one knows, unless the machine is running at high speed on a perfectly smooth road,

makers aim to turn out forks that are strong enough to withstand this strain, and very few motor cycle forks have proved defective; but it will be readily seen that a fork of this construction must have considerable advantage over the ordinary fork..

The motor of the 1903 model, which is of



MARSH 3 1/2-HORSEPOWER MOTOR CYCLE WITH DOUBLE FORKS.

there is a constant tendency for the front fork of a motor cycle to bend forward,

two horse power, is of the same construction as last year's motor, with a few slight changes to accommodate the change in its position in the frame. The carburetor, which is placed almost in contact with the cylinder head, is one of the best features of the Merkel. Taken apart and carefully examined, it proves to be one of the best of the motor cycle vaporizers. It is so made that the most exact adjustment can be obtained, and once it is adjusted to give the best results, its action is entirely automatic. The machine is controlled entirely by one lever, the spark lever. When the spark is advanced, the increased speed of the piston causes greater suction in the intake pipe, and this acts against a light spring in the carburetor, which controls the inlet of air and gasoline. The farther spark is advanced, the greater is the suction, and thus the mixing valve automatically takes in greater quantities of air and gasoline,



MERKEL MOTOR CYCLE WITH REGAS SPRING FRAME.

fore it issues through the series of small holes drilled on the rear side of the seat mast about midway of its length. The fuel tank is larger than the one used last year, and is suspended from the top frame tube, as formerly. The lubricating oil is contained in a compartment just above the fuel tank, and the induction coil is suspended below. The battery is contained in a tube placed parallel with the seat mast and attached to same. A special feature of the new machine is the new front fork. The fork sides are continued through the fork crown and terminate parallel with the fork stem. The locking device, which clamps the two stems of the handle bar fast in the ends of the fork sides, and also locks the end of the fork stem in the head of the frame, makes a strong support, which relieves much of the strain on the fork crown and fork stem. As every-

the greatest strain being on the stem where it is brazed into the crown. All

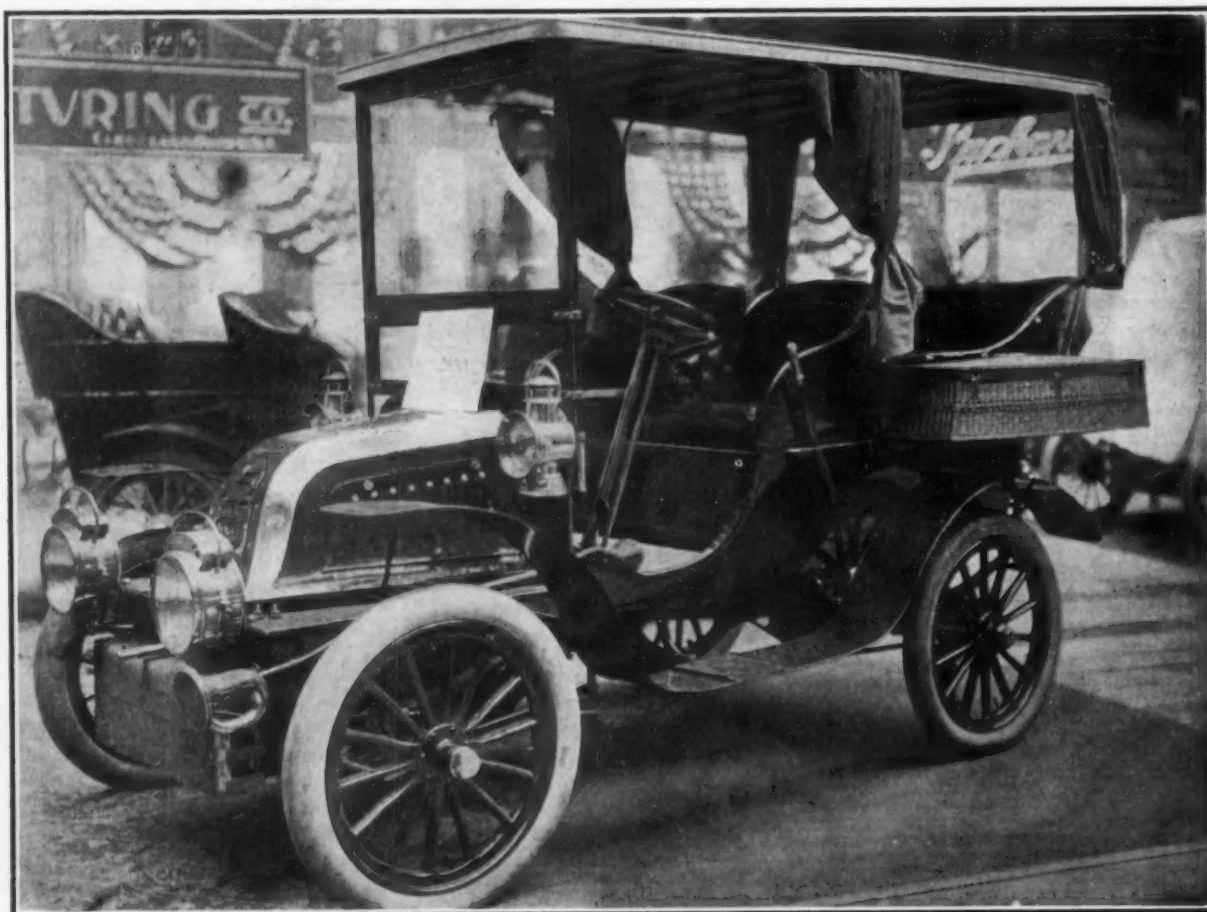


THE 1903 PATTERN INDIAN MOTOR CYCLE.

and supplies the motor with the required amount of gas to give regular and strong explosions. When the spark is retarded, the suction decreases, of course, and the spring gradually closes the air in gasoline inlets. The box containing the make-and-break has a number of indentations on its exterior next to the motor, and there are corresponding shoulders, or little points, to fit a few of these. As the face of the box is of a springy nature, the serrations on the case of the timing gears do not hold the make-and-break box rigidly in one position, but it may be advanced or retarded (by notches) by the spark lever. Thus the lever will remain securely in any

lower, the fork crown is of the four-plate type and strongly made; the exhaust pipe now leaves the combustion chamber at a sharp downward angle, instead of coming out horizontally and making a curve, as in the old model; the muffler is larger; the carbureter has been slightly changed in its exterior design and has been placed a trifle closer to the cylinder, and the fuel tank, which also contains the lubricating oil tank, is considerably larger. All this, of course, consists of little more than refinements, and the Indian is a better machine, apparently, than was the original 1902 model. It may be that the company's representative felt that he was making a

diameter of the bore of the cylinder of the new Marsh motor is 3 1-8 inches, and the length of the piston stroke 3 1-2 inches, giving about 3 1-2 horse power on the brake. The power transmission is by a 1 1-4 inch wide flat belt of double thickness and double stitched, running on large pulleys, the pulley on the drive wheel being a part of the rim and quite massive. The position of the motor is the same, save that it is nearer the ground and displaces the crank hanger, which is now placed behind the crank case of the motor just ahead of the driving wheel. A new muffler is used, which is placed just in front of the crank case, and is a round



LUXURIOUS "LONG DISTANCE" TOURING CAR WITH REMOVABLE TOP.

position, and the vibration of the machine cannot shift it forward or back and change the speed of the machine.

The Hendee Mfg. Co., Springfield, Mass., exhibited one of its 1903 Indian motor cycles, and though this machine differs very slightly in a few minor details from the 1902 model, it attracted a deal of attention. Although show visitors were told that the Indian had not been changed in the least, the motorist who knew discovered that several improvements were noticeable. True, the general principles of design have not been altered, but the 1903 model differs in several ways from the 1902 model shown at the automobile show at the close of 1901. The frame is a trifle

strong point by giving the impression that the Indian had not been improved for the reason that the manufacturer had forestalled all other makers and finality had been reached, so that the machine had not, and could not be improved.

The Motor Cycle Mfg. Co., Brockton, Mass., exhibited two of their new model Marsh machines, and they attracted considerable favorable comment. The chief attraction, however, might be said to have been the price. The Marsh people have retained the same general lines of construction, but have made a big change in the size of their motor and in their power transmission system, having gone from one extreme to the other in both. The

box, into which the exhaust pipe enters through a hole at the side, instead of at one end, as in most all other silencers. The fuel tank is considerably larger and is held in place by four lugs, two around the top bar of the frame, one around the lower cross tube next to the head plug, and one around the seat mast. The battery and coil are both enclosed in one case fastened to the rear stays. This year the Marsh Brothers have improved upon their trussed front fork by making the crown plate at the end of the fork detachable from the fork stem, and the two bars of the strengthening truss and a part of the handle bar lug, it being made from a forging. Thus it will be seen that

when the fork stem is placed in the head of the machine and the handle bar is put on and the three lock clamps are screwed tight, there is no possible way for the handle bar to turn, and at the same time the fork crown is relieved of much of the strain by the additional crown at the top of the head.

The pedaling gear of the new Marsh this

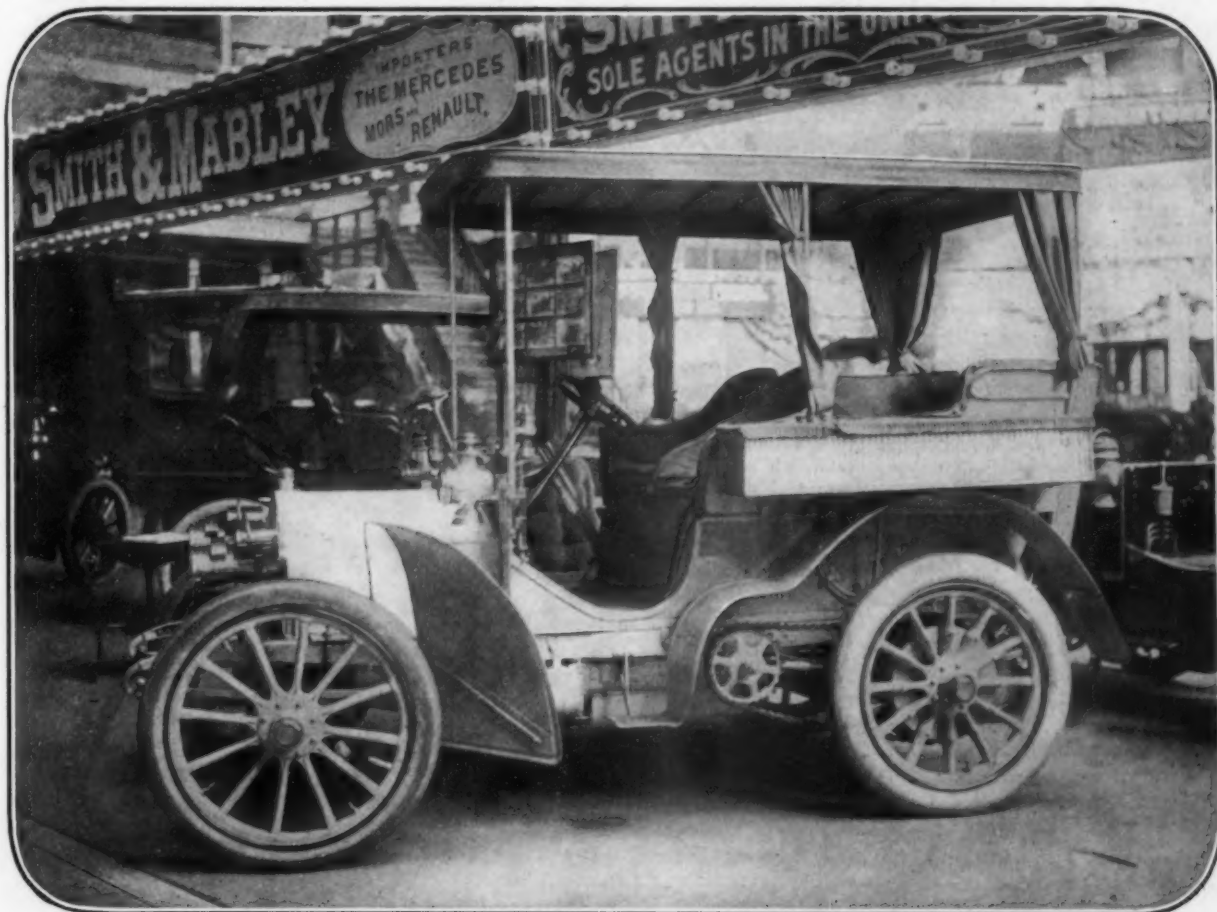
year is 45, and this can be raised by putting on a smaller rear sprocket. There was considerable complaint last year that the gear was too low. The carbureter of the new machine is similar to the one used last year, save that it has been made larger to accommodate the larger motor, and the air inlet port has been made larger.

N. Y.—This company exhibits a large line of its well-known hide and metal gears. The business, which begun with the manufacture of gear blanks, as well as many other articles, from the peculiarly strong and durable hide produced by the company's special process, has developed into the cutting of accurate gears in metal as well as hide. The exhibit includes gears and pinions of plain hide and hide and bronze, such as are so extensively used in motor car work. While the plain hide gear, with its absence of noise, answers for many purposes, the addition of the bronze sections adds to the durability with little increase of noise. A large iron gear is fitted up with both an iron and a hide pinion

Components and Accessories.

The gallery exhibit of parts, fittings and miscellaneous articles has this year extended around the Fourth Avenue end of the building, but a part of the extra space is

This exhibit includes a large variety of the Solar lamp, in various styles and sizes for bicycles, yachts, mining and hunting use and for motor cars, the latter, of course,



IMPORTED DAIMLER-MERCEDES TOURING CAR WITH CANOPY AND CURTAINS.

encroached on by the car exhibits. The display as a whole is similar to that of last year. The makers of lamps, gears and parts show comparatively few novelties, but a general improvement, a greater variety of each article, with changes of detail to meet the advances in the cars, and the strengthening of such weak points of design and construction as have been disclosed by use, with the adoption of better materials to meet the popular demand for less weight and greater strength. There are few freaks shown and few novelties, the exhibit being confined mainly to established firms whose standard products are generally known.

Badger Brass Mfg. Co., Kenosha, Wis.—

being in the majority. While lamps are made to burn kerosene, the acetylene is the more prominent as giving a greatly improved quality and volume of light. The Solar gas generator has a single valve which turns on the water and turns off the gas, or *vice versa*. Two lamps can be used with a single independent generator, located as may be most convenient, the gas being carried through rubber tubes. The Phare Solar headlight is a large and powerful lamp specially adapted to the high-speed cars. The lamps are also fitted with electric bulbs and connections for both car and launch use.

New Process Raw Hide Co., Syracuse,

sliding on the same shaft, so that either may be thrown into gear at will; the hide pinion is noiseless, while the iron one gives out that noise peculiar to all-metal gearing.

Gray & Davis, Amesbury, Mass.—This concern exhibits a large line of lamps, both oil and acetylene, for motor cars and other vehicles. The car headlight has been brought up to date in style and mechanical detail and is a very handsome as well as efficient adjunct to the car.

Baldwin Chain & Mfg. Co., Worcester, Mass., American Roller Bearing Co., Boston, Mass.—The familiar Baldwin chains are shown in large variety, with a new

muffler for gasoline engines, 6 by 22 inches, and weighing but 10 pounds. The American roller bearing, of the familiar pattern, is shown in different styles and sizes.

E. J. Willis, New York.—One of the features of this exhibit is the Bougie-Herz, a spark plug invented by L. G. Herz, formerly connected with the Daimler Company, which has met with great favor abroad. The trailer for motor cycles is also a novelty, a basket body on two wire wheels to be attached to the seat part of a motor cycle, carrying one person. Mr. Willis shows motor car parts and fittings of all kinds.

Joseph Dixon Crucible Co., Jersey City.—This exhibit from its nature gives a very inadequate idea of the great variety of lubricating compounds for which the Dixon Company is noted. These invaluable compounds of graphite are intended for service rather than display, and give no external evidences of their utility. The increasing demand from motorists has been met by a higher quality and a greater variety.

Veeder Mfg. Co., Hartford, Conn.—This interesting exhibit has for its leading feature a new revolution counter and speed gauge, the Veeder tachometer, a number of the instruments being shown in operation. In outward appearance it is much like a thermometer, a glass tube containing a red liquid and mounted on a graduated metal back. Communicating with this tube by a small pipe of copper or rubber is a small centrifugal pump of special design, which is driven by the machine whose speed it is desired to measure. In the case of a motor car the pump is chain-driven from one of the wheels and the metal frame is graduated for miles up to 30 or more. For application to machines the frame is graduated for the number of revolutions. The pressure on the liquid due to the speed of the pump shows the result on the scale. A number of the instruments are mounted on a table, the pumps being driven by an electric motor; the different gauges show a regular indication with no fluctuation. The tachometer is applicable to all vehicles.

The Veeder cyclometer and odometer are shown in various styles, the latest being a water-proof odometer with double glass face and perfectly tight joints, so as to be uninjured by the weather or by the hose in washing the car. Special brackets are now in stock for attaching the odometers to many standard makes of machine, and the company has its draftsmen at work at the Show preparing similar attachments for the new machines.

The Post and Lester Co., Hartford, Conn.—This exhibit includes a large line of motoring appliances, horns, caps, goggles, lamps, steering wheels, etc. The company carries a very complete stock in this line, only a small part being shown.

Rose Mfg. Co., Philadelphia, Pa.—The Neverout lamp, which made a reputation in the days of the bicycle, has grown into the new and larger field of motoring, and this year makes an excellent showing. It is

made for both kerosene and acetylene, and a new pattern of kerosene lamp, with a glass covering to the reflector, is shown; at the same time the larger headlights and car lamps are all acetylene. The new Hydro-Pneumatic Safety system is used in the larger acetylene lamps, the generator is separate from the lamp and may be used independently or as a part of the lamp. It is in two parts, the water tank above and the carbide reservoir below, these parts being easily separable. The water and gas are controlled by a single valve, the action being instantaneous. The gas passes up through a central tube in the water reservoir, being cooled by the surrounding water, and then passes through a tube packed with cotton and a little carbide, the cotton straining out all the impurities and the carbide absorbing any moisture, so that the gas goes to the burner in a clean and dry condition. A special device is used as an improvement on the usual gas bag; a diaphragm of sheet rubber is inserted between the two parts of the generator, being easily renewable. The pressure of the gas on the upper side of this diaphragm acts to close a valve and shut off the supply of gas.

Twentieth Century Mfg. Co., New York.—Out of the very large line of lamps for all possible uses manufactured by this company a number of samples of car and cycle lamps, oil and acetylene, are shown. These have the features which have contributed to the reputation of the 20th Century lamp and which are already well known. The new motor cycle lamps are shown with a special bell front of aluminum.

The Auto Supply Co., New York.—This company furnishes parts of all kinds for builders, among its specialties being the Mohler & De Gress vertical motor and change speed gears and a horizontal motor of 9 horse power. Two running gears are also shown, with bells and other parts. The company has also a complete vehicle, shown in its priming coat, a car of the French type with Mohler & De Gress motor. The Vobel steam engine is shown, three cylinders with one balanced rotary valve.

R. E. Deitz Co., New York.—Most of the very large display of lamps made by this company are of patterns familiar to motorists, but a novelty is shown in the Lucifer acetylene lamp. The carbide reservoir is placed below the lamp and the water, instead of dropping in one spot, is fed around the entire circumference of the reservoir, over 9 inches. Fed in this way, the water attacks a large area of carbide, which is quickly converted into gas, and no water can soak into the mass of carbide.

A. H. Funke, New York.—The Autolyte lamp is shown in different styles for headlights and tail lamps. A special design is fitted with a candle attachment, by which a candle may be inserted, in a spring holder, when the lamp is to be used merely as a signal and not for lighting the road. An attractive display of horns is made. The

Kelecom motor for motor cars and cycles is shown complete and in section. The Baldwin spark plug is also shown.

C. F. Splitdorf and Hendee Mfg. Co.—The attention of visitors is attracted to this stand by a spark more than 12 inches in length, shown between points high up on the wall. The exhibit includes different styles of this well-known coil.

National Carbon Co., Cleveland, O.—This exhibit includes a number of the Columbia dry cells, the "Autocell" and coils, a gasoline motor in operation being used for purposes of demonstration.

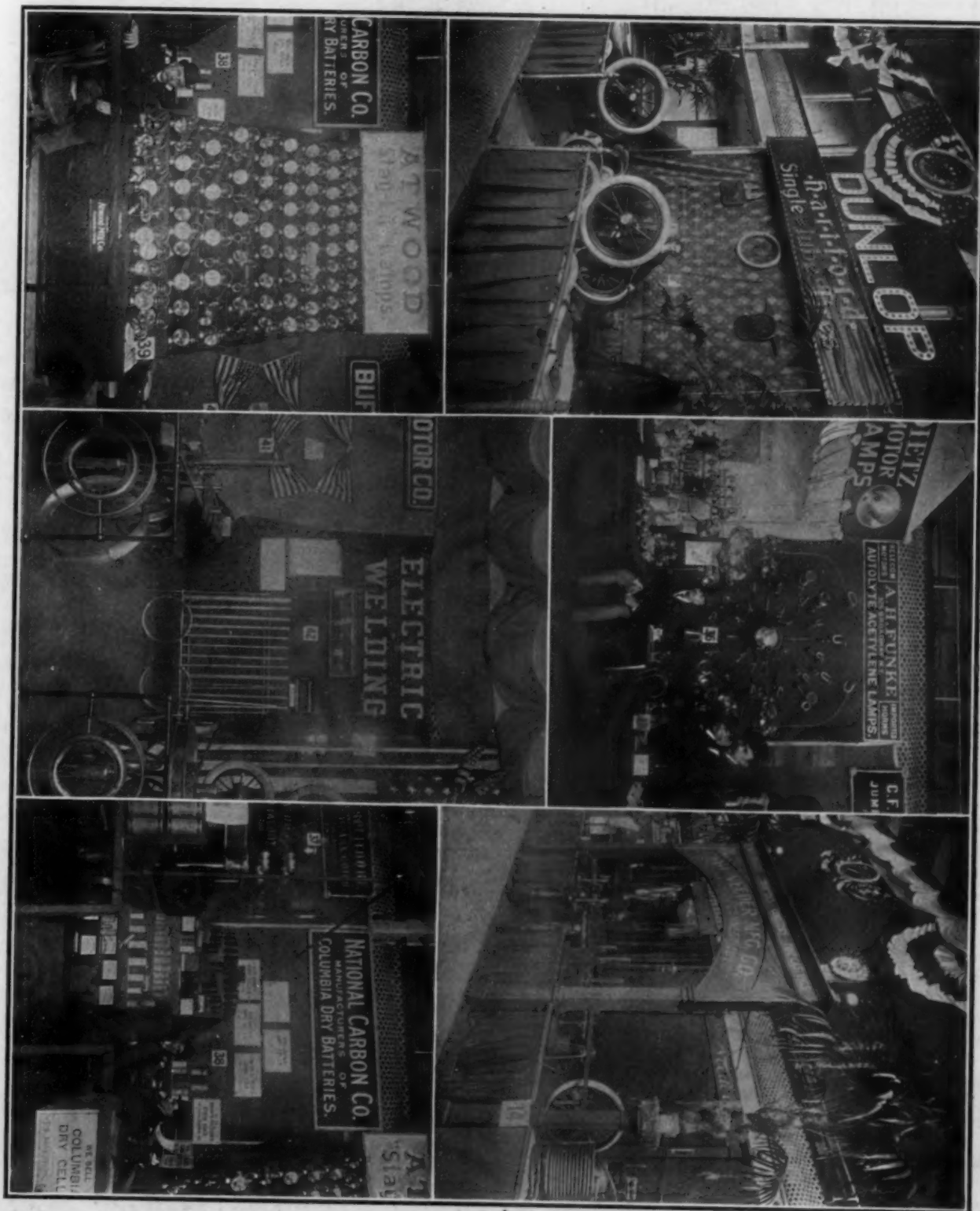
Atwood Mfg. Co., Amesbury, Mass.—The Staylit lamp shown at this stand is a carriage lamp burning kerosene and intended for the lighter class of vehicles. It is of special construction, designed to obtain the best possible results. The lamp is also made in a special pattern for electric vehicles, with electric light in place of kerosene reservoir and burner. A special form of water glass mirror is also shown.

Standard Welding Co., Cleveland, O.—This exhibit includes some interesting samples of electrical welding in rims and other parts, including bolts of 1 1-2 inch diameter, with the heads welded to the shank.

American Ball Bearing Co., Cleveland O.—A large Rushmore searchlight with lens mirror serves to draw attention to this stand where a number of interesting novelties are displayed. The wheels, six in number, are shown on a revolving cross mounted on one of the company's bearings. These wheels, all of the artillery pattern, fitted with a new hub so proportioned as to bring the spokes close up to the steering knuckle while the main ball bearing is directly in the plane of the spokes, the outer extension of the hub carrying a steadying bearing with smaller balls. Another new feature is the use of pressed steel for the hubs, giving a gain in strength and lightness. Duplicates of the very massive rear axle and hubs made famous by H. W. Whipple's Packard car are shown. The company is introducing a new rear axle, one of which is shown, the outer cup is pressed from steel, as is the case of the differential, the two being welded to the connecting steel sleeve. The two halves of the differential case are bolted together in the usual manner. The use of pressed steel in place of castings gives a material gain. A variety of knuckle joints and axle ends as made for the standard makes of cars from the light runabouts to the heavy touring cars, are shown. The company is now making two thrust bearings for marine propeller shafts after the pattern successfully introduced by it in launches, but with balls 4 1-2 and 3 inches in diameter, for 15-inch and 12-inch shafts respectively.

The Whitney Mfg. Co., Hartford, Conn.—The Whitney chains and sprockets are shown to excellent advantage in a train of gears made up of twelve sets of sprockets and chains connected into a single drive,

CHARACTERISTIC VIEWS OF THE GALLERY STANDS EXHIBITING PARTS AND ACCESSORIES AT THE MADISON SQUARE SHOW.



the sizes ranging from a quarter-inch chain to 1 1-2 inches.

The Dorr Portable Electric Co., Boston, Mass.—This exhibit includes the coils, batteries, spark plugs and pocket testing instruments already well known in every-day use. To meet the general demand for the French type of car the company has introduced a coil in a handsome mahogany case for attachment to the dashboard; care is taken to make all parts dust-proof. The Methot carbureter made by the company is also shown.

Charles E. Miller, New York—This exhibit has the same position as in the preceding shows, at the head of the stairs on the 26th Street side, but it has expanded until it covers six spaces. Within this large area is shown everything used by the builders or owners of motor cars in such variety and number that even a bare summary is impossible. The display of goggles is also very complete, including some novelties in fur-lined mask goggles for winter use.

The Dayton Electrical Manufacturing Company, Dayton, O., has an exhibit in Mr. Miller's space, as he is the New York agent. The standard Apple dynamo is shown in various styles, being improved by a governor. A distinct novelty is the new Apple magneto for launch and motor cycle engines, a very light and compact mechanism, the base being 2 1-2 by 5 inches, the height 6 inches and the length over all 7 inches, with a total weight of 8 1-2 pounds. It is wired to run at a slow speed and the bearings are self-aligning and need no oil. It is completely enclosed, but the parts are easily accessible. One of the Apple dashboard igniters is shown in position on a model dash with the King automatic timer, by which four cylinders are served, with automatic advance and retardation of the spark. The timing apparatus is placed in the dash, with a glass front, the action of each of the four connections being directly under the eye of the operator. The Mosler "Spitfire" plug is also shown at this stand.

Thomas J. Wetzel, New York—This exhibit includes the Midgeley wheels, the Brown-Lipe gears and the Timken roller bearings. Those familiar with the Midgeley tubular all-metal wheel as exhibited at the last show, with oval spokes staggered after the style of the ordinary carriage wheel, would fail to recognize the construction in the handsome artillery wheels; to all appearances the latest type of wooden wheel. Two styles are shown, the ordinary artillery wheel and that with swelled spokes for the bolts of the chain sprockets, as in the foreign cars. The light weight and handsome finish of these wheels go far to commend them, and the construction has been fully tested in the past year. One improvement is the addition of a thimble inserted through the felloe and butting against the rim, to which it is riveted. The outer end of the spoke slips over this thimble and a rivet secures the two. The hubs are of stamped steel, either brazed or riveted to



COVERT 850-POUND CAR WITH LONGITUDINAL SHAFT DRIVE.

the wheels. The construction is shown by sections of the new spokes and by a wheel brazed but not painted.

The Brown-Lipe gears are shown in an increased variety of styles and sizes. A new pattern specially adapted to the bevel-gear drive is shown. Another novelty is the Brown-Lipe steering gear, for which patents are now pending. This gear is small and compact, but powerful, self-locking and requiring but a three-quarter turn of the wheel to throw the lever through the half quadrant. The bronze case is hemispherical in shape, within which is a second hemisphere internally threaded to gear with the worm wheel, the steering column being connected to this nut. There is a minimum of backlash and provision is made for taking up the loss by wear. The case is oil tight.

The Timken roller bearings are shown with pressed steel hubs, and a complete rear axle is shown with the differential surrounded by an open cross, each half a steel

casting to which the main sleeve is welded.

Champion Mfg. Co., Brooklyn—The Champion change-speed gears for motor cars and launches are shown in various styles.

Weston-Mott Co., Utica, N. Y.—This company shows its wood and wire wheels and axles. A new rear axle has the differential within an open circular frame, two steel castings, with double tie rods.

Gleason-Peters Air Pump Co., New York—In addition to the standard goods made by this company and familiar to motorists, there is shown a new folding tire pump, very compact and powerful, with positive action, and a small squirt pump for forcing the heavier oils into remote parts of the machinery. In addition to the Janney-Steinmetz circular tanks handled by this company there is shown a rectangular tank of steel plated with copper, of such form as to be fitted to the dashboard, for either oil or water.



UNION MOTOR TRUCK, WITH RATCHET TRANSMISSION GEARING.

Hyatt Roller Bearing Co., Harrison, N. J.—The spiral spring roller bearing made by this company is shown by different models and open bearings.

Whitlock Coil Pipe Co., Hartford, Conn.—The coil radiators with different specimens of tube bending in brass and steel are shown.

Shelby Steel Tube Co., Pittsburg, Pa.—This exhibit includes two spaces filled with samples of the work of the company, from the finest wire tube used for surgical purposes up to three- and four-inch tubing. Both round and square seamless tubing is shown.

Baker & Co., Newark, N. J., Canda Mfg. Co., Canda, N. J.—The Baker Company shows aluminum and its special points for

Edison Storage Battery Co., Orange, N. J.—The Edison battery in its commercial form is shown, the cell being of nickel-plated sheet steel. The plates, terminals and chemical agents are shown separately, apart from the complete cell and a full battery in its case.

Cole & Woop, New York—This exhibit includes a child's electric runabout, the smallest car in the Show, and a model body showing construction.

Interesting Tire Exhibits.

The tire exhibit includes all the standard makes of solid and pneumatic tires, but presents few novelties. While makers are

solid. The pneumatic tires show a greater thickness of rubber on the tread.

The Hartford Rubber Works Co., Hartford, Conn., shows its standard makes of tires, the chief being the Dunlop detachable. The Turner solid tire, with four endless wire rings and endless rubber body, is shown complete and in section.

The Fisk Rubber Co., Chicopee Falls, Mass., shows its new detachable double tube tire. A flat rim is used on the wheel, and after the tire is in place two steel rings are fitted, one on each side over the flange on the base of the tire. These rings are forced inward by a series of bolts and dogs, wedging the tire firmly, but permitting its easy removal, the only tool needed being a wrench. The Firestone Tire & Rubber Co., of Akron, Ohio, shares the same space, showing its side-wire tires.

The B. F. Goodrich Co., of Akron, Ohio, has a large space on the north balcony where it shows a full line of its clincher and solid tires.

At the front end of the south balcony is the exhibit of the Diamond Rubber Co., of Akron, Ohio, with a number of the well-known Diamond detachable tires.

The G & J Tire Co., Indianapolis, Ind., shows its clincher tires in various styles and sizes for all classes of vehicles.

The Consolidated Rubber Tire Co., New York, shows a new form of solid tire for heavy vehicles, the tread being in the form of square projections, with spaces of the same size between, giving a resemblance to a large spur gear. This corrugation gives a resilient tire, with great tractive power.

The Beasley elastic tire is shown by the Standard Anti-Friction Equipment Co., of New York.

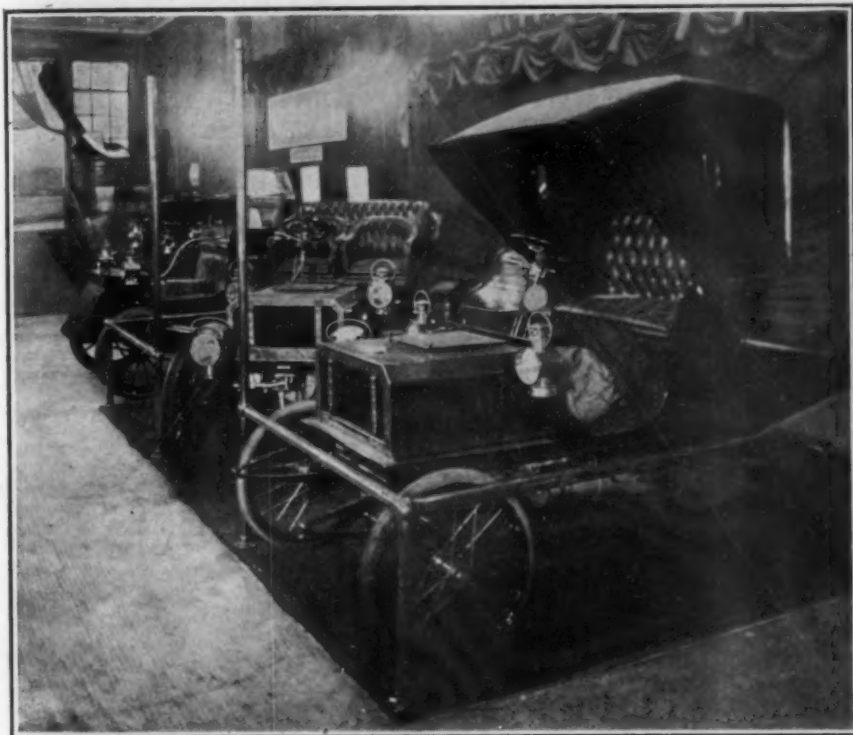
The Metallic Rubber Tire Co., New York, shows combination cover of rubber, armed with wire rivets, to prevent wear and slipping.

The International Auto and Vehicle Tire Co., of Milltown, N. J., shows its regular make of tires.

A novel tire cover exhibited by the Cummings Tire Mfg. Co., New York, shows "Cinch" tire protectors, a heavy canvas cover carrying a band of sole leather about 3 inches wide, this in turn being protected by a narrower band of leather sewn to it with wire. It is claimed that the tire is completely protected from dust and moisture, as well as from danger of puncture, while its tractive power is increased.

EDISON STORAGE BATTERY AGAIN PUTS IN AN APPEARANCE.

The Edison Battery Co., which has maintained a profound and somewhat forcible silence for the last year, showed a set of cells for a 10-horse power delivery wagon, and also detached parts of cells showing the construction very fully. The battery grids are little changed from those shown



GROUT AND CONRAD GASOLINE AND STEAM CARS.

spark terminals. The Canda exhibit consists of a quadricycle.

Electric Contract Co., New York—The leading feature of this exhibit is the Jones speedometer, a case of the shape and size of the ordinary portable barometer, to be attached to the dashboard, a hand and dial showing the speed of the car. The instrument is operated through a flexible shaft by a friction disk driven from a wheel, or in a simpler form for light cars it may be attached direct to the steering knuckle. It is made in two sizes, up to 30-mile speed and up to 90-mile speed.

Goodson Electric Ignition Co., New York—This company manufactures a magneto of special type for launches and motor cars, generating a primary current and dispensing with coils and batteries. It gives a spark of constant strength regardless of the speed of the engine, and it may be run in either direction.

striving to meet the growing demand, their efforts are directed less to the search for new devices than to the improvement of methods of manufacture which will insure a high quality of product.

The Goodyear Tire & Rubber Co., of Akron, Ohio, has the central space over the main entrance usually occupied by the orchestra. Here are shown the Goodyear detachable tire, with movable flange, two being mounted on axles for demonstration. In this tire two metal rings held by bolts through the felloe are used, by removing the bolts, twelve in number, one ring may be removed, the tire easily following. The operation of removing and replacing the inner tire is shown by an attendant, the entire time being less than five minutes. A tire 6 by 40 inches is shown in place on a wheel; also samples of other Goodrich tires, clincher and

a year ago, but the details of the filling caps, gas vents, etc., appear to have been more fully worked up. Only one size of the cell is now made, but others will follow.

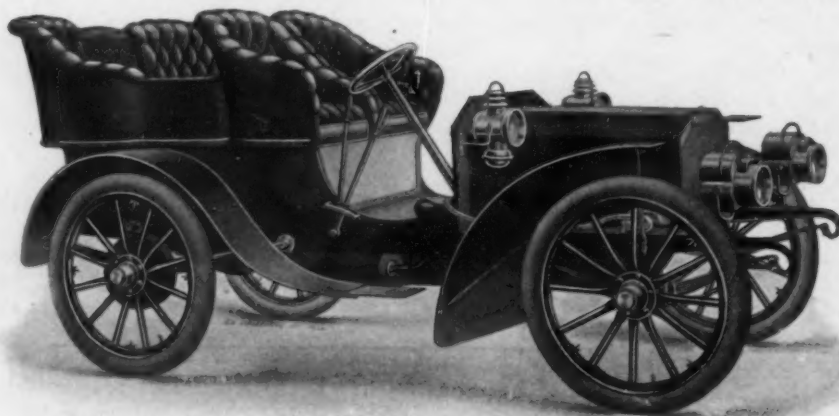
To speak first of the capacity, the cells shown are rated at 200 watt hours each, and weigh complete 17 1-2 pounds, including the tray. Their average voltage on discharge is from 1.3 to 1.2 volts. The rate of discharge does not appear to affect the integrity of the plates, as these have been discharged at rates up to 200 amperes. According to Mr. Edison, a signed statement from whom was to be seen at the exhibition stand, a battery weighing 460 pounds, when installed in a Baker runabout, carried one person 100 miles to a standstill at an average speed of ten miles an hour on fairly level macadam roads. The battery may be charged very rapidly, a charge sufficient for 75 miles with the above mentioned runabout requiring only one hour. A sample plate was shown from a battery which had been run 3,100 miles over rough roads, and the only thing to distinguish its appearance from that of a perfectly new plate was a slightly yellow color of the nickel-plated cell grid and envelope.

Although the battery was fully described in the technical press at the time of its first appearance, a recapitulation may be useful. The active material of the positive plate is composed of a mixture of flake graphite and some compound of nickel, said to be a superoxide; the active material of the negative plate is iron oxide, very finely divided by a chemical process, giving it a floury, almost flocculent appearance. These materials are molded in little briquettes, which are then enclosed in perforated steel boxes, about $\frac{1}{2}$ of an inch wide by 3 inches long and 1-10 of an inch thick, and 24 of these are introduced into little windows of corresponding size in the thin steel grids. Each cell has 24 of these plates, their exact size being 9 3-8 by 4 3-4 inches. They are insulated from each other and from the wall of the cell, which is of thin corrugated sheet steel, by hard rubber separators. Except for the active material and the leads connecting the terminals of adjacent cells, which are nickel-plated copper, all of the metal work is steel and nickel-plated. Unlike the lead storage cell, the electrolyte undergoes no chemical change with charge or discharge. It is a 20 per cent. solution of caustic potash, and its sole function is that of a carrier for the oxygen molecules exchanged between the positive and negative plates. Consequently a very small amount of electrolyte is required, and the internal resistance is substantially uniform whether the cell is charged or discharged. The potash ingredient of the solution suffers no change, and requires no attention except to add distilled water to make up for that decomposed and given off as gas during the final period of charging. The cells have sheet steel covers, which are soldered on, and the whole cell is both liquid and air

tight except for the gas vent. A small filling cap is provided, and it is kept tight by a rubber washer, so that there is no creeping of the potash.

As the figures of capacity show, the bat-

cost? and, When can you deliver it? To this the invariable reply was that the company expected to make a few deliveries next spring or summer, but had not yet begun the manufacturing, and, therefore, had no



MATHESON TONNEAU WITH MERCEDES PATTERN RADIATOR AND HOOD.

tery is remarkable, not so much for unusual capacity per pound as it is for the rapidity with which it may be charged and discharged and for its ability to stand what in any other battery would be outrageous abuse. In a word, its capacity is substantially 11 1-2 watt hours per pound at ordinary rates of discharge, this falling off a little as the rate is increased. But a 160 ampere hour cell, which in ordinary use would be discharged in six or eight hours, may be discharged in an hour, and be as good as ever on the next charge. If the claims of its makers, based on the tests of the past year, are verified by the performance of the battery in the hands of the public at large, it has the unique distinction of being the only absolutely fool-proof storage battery ever invented. So far as can at pres-

idea what the battery would cost. For the answer to this last momentous question we must wait yet a few months longer.

Electro-Magnetic Speed Changing Gear.

The Electro-Magnetic Speed-Changing Gear Company has on exhibition a chassis in which is embodied a speed-changing mechanism designed to do away with 90 per cent. of the muscular effort required in changing speeds. It consists essentially of an extension of the motor shaft carrying four gears and three drums with magnetic clutches. Two jack shafts, lying one to either side of and below the main shaft, carry each two gears meshing two and two with the gears on the main shaft. The rearmost pair of gears on the main shaft



MOYEA 16-HORSEPOWER CAR, PATTERNED AFTER THE ROCHET-SCHNEIDER

ent be learned, it is not even destructible by ordinary use, and ought to last indefinitely.

Naturally, the questions most often asked at the exhibition stand were: What will it

are loose on that shaft, but connected to the jointed bevel gear shaft, and each of the two forward gears is connected to a magnetic clutch. Thus the low speed and intermediate speed are obtained through the

jack shaft by energizing the magnetic clutches, while the high speed, obtained by the third clutch, couples the engine shaft to the jointed shaft in a direct drive. A device is added for disconnecting the two gears on the jointed shaft, so that the shaft turns loosely inside of them, the result being that no gears run on the high speed. Reversal is effected by engaging intermediate pinions by shifting.

TOASTS AT ANNUAL BANQUET OF N. A. A. M.

At the annual banquet of the National Association of Automobile Manufacturers on Friday, January 23, the guests of honor were Frank W. Sanger, Wm. C. Reick, J. Seaver Page, J. C. Young and T. M. Hilliard. Seats were provided for more than 250 persons. The list of toasts was as follows:

"City of New York," Jacob A. Cantor; "Horses, Carriages and Motor Cars," F. S. Fish; "National Aid to Road Improve-

city at 4 P. M. Friday, had on board about fifty persons directly interested in the trade, and an almost equally large crowd left Saturday afternoon. All of the factories were represented by two or three, and in some cases four, persons, while the parts makers and dealers left

of the automobile in every way possible, and I cannot see what harm it would have done if the trade papers had had booths from which they could sell or give away their periodicals, solicit subscriptions, etc. On the other hand, I am sure it would have done a great deal of good.

It is, of course, too late now to give them any space, but I hope the association will make some arrangements by which the publishers will be allowed to distribute as many papers as they like, either to the exhibitors or to the general public who are in attendance.

Automobile manufacturers either directly or indirectly pay for the advertising of the automobile papers, and it is certainly to their interest that they should be distributed as widely as possible among prospective automobile purchasers.

Most of the automobile papers have gone to the expense of getting out special show issues, and why the association wishes to prevent the publishers from distributing these as lavishly as possible and so giving the advertisers as much benefit as possible for their money is certainly more than I can understand.

Will you kindly bring this matter to the attention of the proper parties who have authority to act, and greatly oblige

Yours very truly,

SEARCHMONT AUTOMOBILE CO.,
W. D. Nash,
General Manager.

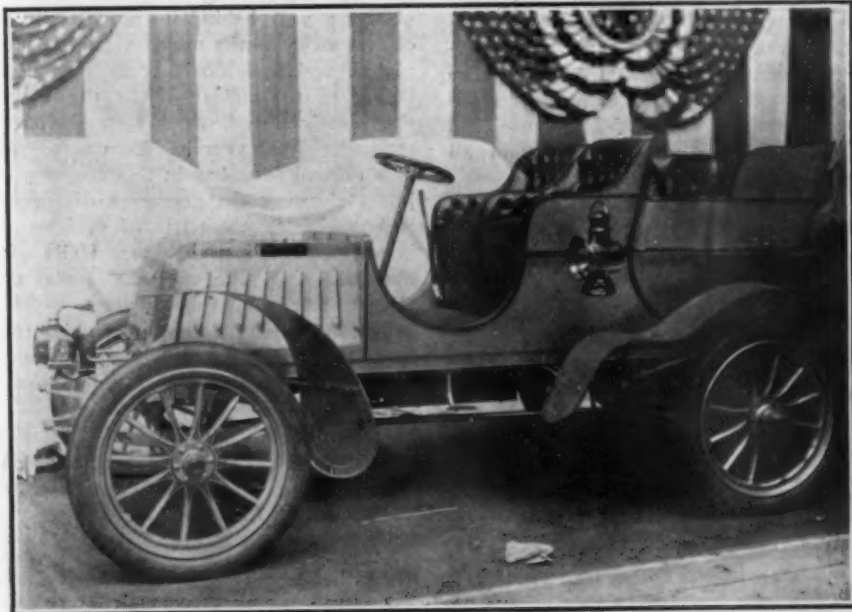
Entertainment at the Chicago Show.

The committee of the Chicago Automobile Club on entertainment at the coming automobile show is busily at work. Handsome quarters will be fitted up at the Coliseum, where good cheer and other things will be on tap, with the genial Frank X. Mudd in charge. Open house will be the order of the day at the clubhouse also.

At the coming automobile show in Detroit, February 9 to 14, a match will be run off between Tom Cooper and Barney Oldfield. Arrangements are now being made for the construction of a temporary track.

DATES OF SHOWS, BANQUETS AND CONVENTIONS.

- Jan. 23 — Annual Business Meeting National Association Automobile Manufacturers, Madison Square Garden, New York.
- Jan. 24 — Annual Banquet Automobile Club of America, Waldorf-Astoria Hotel, New York, 10 P. M.
- Feb. 2-9 — Local Automobile Exhibition, Gray's Armory, Cleveland.
- Feb. 9-14 — Tri-State Automobile and Sportsmen's Show, Detroit.
- Feb. 14-21 — Third Annual Automobile Exhibition, Coliseum Building, Chicago.
- Feb. 20 — Good Roads Convention, National Association of Automobile Manufacturers, Coliseum, Chicago.
- Feb. 19 — Smoker for Trade Visitors, Convention Hall, Coliseum Building, Chicago.
- Mar. 2-7 — Local Automobile Exhibition, Horticultural Hall, Philadelphia.
- Mar. 9-14 — Local Automobile Exhibition, City Convention Hall, Buffalo.
- Mar. 16-21 — Local Automobile Exhibition, Symphony Hall, Boston.



GASOLINE TONNEAU OF METEOR ENGINEERING CO.

ment," George A. Pearre; "What Lawyers Hope for from Automobiles," John S. Wise; "Improvement of Our Highways and Construction of Automobiles," Albert L. Shattuck; "Electrical Matters Pertaining to Automobiles," T. C. Martin; "Various Phases of the Automobile Industry," O. C. Barber; "Automobile Literature," S. A. Miles; "How to Sell Automobiles," F. L. Smith and "Western Highways," H. H. Gross. The toastmaster was Winthrop E. Scarritt.

Clevelanders Come in Full Force.

Special Correspondence.

CLEVELAND, Jan. 19.—There will be many Clevelanders at Madison Square Garden this week. The Lake Shore & Michigan Southern train which left this

in full force. The Cleveland aggregation was also augmented by dealers and manufacturers from Akron, Elyria, Geneva, and other neighboring towns.

Automobile Papers at the Show.

(An Open Letter.)

Jan. 15, 1903.

MR. HARRY UNWIN, Secretary National Association Auto Manufacturers, New York.

Dear Sir:—I have just learned that the automobile papers are not allowed to exhibit in the Automobile Show. I presume the association have good reasons for making this ruling, but I wish to put myself on record as saying that I think it was a decided mistake. The Automobile Show is supposed to further the interests

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SATURDAY, JANUARY 24, 1903.

TENDENCIES AT THE SHOW.

Most notable of all the tendencies which the gathering together of the best products of our builders at the Garden exhibits is that toward the distinctively "automobile," or foreign type of vehicle, as distinguished from the hitherto prevailing shiftless carriage of American type. It is with us more a process of evolution than of imitation, though the result might seem otherwise. A counterpart for this can be found in the early history of railway construction, in which the pioneer types of vehicle closely resembled in outline the stage coaches of that day. The designers of the day had not grasped the idea that the railway coach was else than a stage running on rails. The case of the automobile is not exactly parallel, for while the railroad car is built practically for one specific purpose, the automobile is, or should be, built for the special use for which it is intended, and such uses are many and varying. That the distinctively automobile type is best adapted for long distance cars of moderate or high power is very conclusively argued for by its adoption by the skilled constructors of all nations. It is the prevailing type abroad for the reason, however, as much as any other, that there the automobile is at present the vehicle of the classes who have time and money to devote to extended trips and pleasure journeys. Here, where every man who walks may ride, and where the automobile has been developed more extensively along utilitarian lines than abroad, the carriage type is a necessity, and will no doubt long survive. The question of price becomes a serious consideration, and cannot

be disregarded by the designer, who finds the outlet for his skill along carriage lines. Properly used our runabout type, for which there is practically no counterpart abroad, is an ideal vehicle. But the tendency is marked, and no doubt in time the types will be more sharply defined, no matter what the motive power may be, and each bought and sold with regard to its suitability for widely different uses. There is also observable at the show a drift in the direction of comfort in vehicles of all styles, and especially of the "automobile" type. In France this is already an established feature of construction, as was very noticeable at the Paris show, and even more so in the stream of automobiles on the thoroughfares. Protection from rain by canopy and curtains, and from dust by glass screens, is so frequent as to be the rule rather than the exception.

In very many vehicles the constructor has provided more substantial shelter, and removable tops, with glass sides, are common. Where permanently enclosed vehicles are not used. Thus the automobile, first used by the owner as a novelty or plaything, perhaps, has come to be considered the proper vehicle for modern locomotion and continual use has caused, the demand for comfort in all conditions of weather.

MENTAL AND MATERIAL PROGRESS.

The great strides made in design and construction during the past year, manifest as they were in many ways at the Madison Square show, were nowhere perhaps more clearly proved than in the very general willingness of makers to exhibit publicly the inner workings of their machines. For the one lone chassis (and that a French one) of 1900, there have been in the neighborhood of a score this year, and the number of engines and gear cases dissected for the benefit of the critical is proportionately great. The men in charge, too, were as a rule willing to tell all they knew; and it may be added that they seemed to know considerably more than their predecessors of the two previous shows.

All this means, of course, that the public, taught by experience, has become critical and is no longer content to appraise the worth of a car by the style of its body. It means also that the "trade secret" is no longer serviceable as a cloak to cover sins in construction, and that the antics of the half-baked "inventor" are giving place to scientific engineering. But it means something else as well. When three years ago the trade journals urged the benefits to flow from mutual interchange of ideas among manufacturers, and the impetus which such interchange would give to automobile progress, they spoke to deaf ears. Rather than risk the calamity of aiding a competitor, each builder elected to follow closely the

groove of his own progress and let the rest do likewise. The result was a vast amount of time and money spent in experimenting with crude types of cars, which had to be abandoned before progress could be made. Meanwhile, our transatlantic cousins were discussing, comparing, standardizing—and progressing. We have progressed, too, but it has been by throwing away most of our old models and accepting gracefully the lessons to be learned from across the water. Just at present some of us are learning our lesson a bit too literally, and forgetting that perfection on macadam is not necessarily perfection in ruts or mud, and that the most finely-built car may go to pieces on roads for which it is insufficiently flexible. We fancy that few of the cars seen at the show would amount to much on a corduroy road.

But that is a detail. Whatever the roads, progress in automobile building, as in everything else, is made neither by secretiveness nor by blind imitation. If the first means stagnation, the second is always a year behind its model. By exchange of ideas the minds of all are stimulated, and individuals profit in the uplifting of the industry. In the French show lately closed, which showed that the progress of the year has been as remarkable abroad as it has in this country, exhibits showing the processes of forming and machining the parts of vehicles. It is a significant fact that, practically without exception, the machine tools thus shown came from this country.

The American builders of machine tools have reached their enviable position of leadership through absolute freedom in the exchange of ideas. How long will it take American automobile builders to place themselves on the same proud eminence? They are not there yet, but the situation is in their own hands.

MINOR SHOW EXHIBITS.

Next to the cars themselves the most interesting part of the Automobile Show is the display of parts, materials and fittings which fills the galleries. One result of the rapid growth of the motor car has been a complete resolution in certain lines of manufacture only incidentally allied to the main industry. Such articles as lamps, chains and odometers, produced in large numbers, but of small size and simple construction for the bicycle, are now in demand, not only in quantity, but of vastly increased size and power.

Manufacturers who but a few years ago were with difficulty induced to make changes in their regular machinery and methods in order to produce what then seemed a most insignificant article have in many cases abandoned their original line of work and enlarged and remodelled their plants to meet the demand for the new device. One has only to look back to the old bicycle lamp, of cheap and

clumsy construction, and practically useless out of doors, and then at the handsome and powerful acetylene headlights of the motor car to realize the extent of this change. Starting from a similarly small beginning, the chain and sprocket have developed in design and methods and materials of construction, carrying with them a corresponding improvement in machine tools for their production.

Great as it was in the days of the bicycle, the tire industry has attained still more magnificent proportions, and it is evident that the general displacement of the old rim tire by rubber, or some mechanical equivalent, has hardly begun. The bicycle and the motor vehicle have taught a lesson in easy traction and comfortable riding which will eventually appeal to all users of vehicles.

The development of the seamless tube industry, which began with the bicycle, has received a new impulse from the demand for larger sizes in greater variety, as well as improved quality. A similar line as yet undeveloped, but in which great progress may be looked for in the near future, is that of pressed steel plate, not merely for small objects, such as hubs, but for the larger members of the frame.

The progress of the past few years has done much to impress upon the manufacturers of small special articles and lines of material the importance of meeting demands which, while apparently trivial and unprofitable, may eventually prove most valuable.

The motor car industry is calling for new materials, new adaptations of old materials and methods, and new specialties in infinite variety. This field is open not alone to large manufacturers or to those in any one line, but to all who by ingenuity or inherent ability can contribute to the improvement of the car itself or the safety and comfort of the user.

Bill for Slower Speed in Connecticut.

NEW LONDON, Conn., Jan. 17.—Representative J. R. Warren, of New London County, has introduced a bill in the General Assembly providing that automobiles and other horseless vehicles shall not be run over the country roads in this state at a speed in excess of eight miles an hour. The bill provides a fine of not less than \$50 nor more than \$100 for violation.

Mr. Warren says that in introducing the bill he is endeavoring to correct an abuse that has been very annoying to the people residing in country towns. He specified several notable accidents, as those in New Haven, and stated that in the town of Lyme minor accidents have occurred. His bill was introduced under pressure brought to bear upon their representative by the residents of Lyme. The sentiment of Lyme is not, however, to be regarded as representative of the sentiment of all Eastern Connecticut.

Winton and Fournier Matched to Ride Three 25-Mile Races.

Immediately on his arrival in New York, Henri Fournier announced his desire for a race with Winton for the track record won from him by the latter, offering to make a special trip to America later in the year. The managers of the Empire City track at Yonkers, near New York City, at once offered to put up a silver trophy and a large purse, but when the news was telegraphed to Mr. Winton he declined to accept the challenge, on the grounds that he was too busy at present, and the season was not suitable. A clearer understanding of Fournier's offer brought the following telegram from Winton's representatives:

Alfred Reeves, Secretary Empire City Track:

If track event can be arranged after Gordon Bennett cup race, Mr. Winton will accept Fournier's challenge, and will name conditions after his arrival in New York on Saturday. You may so announce.

CHARLES B. SHANKS.

Later on Winton issued the following statement of the conditions on which he would race:

"Contest to be not earlier than July 25, 1903, the exact date to be mutually agreed upon later. Track to be hard and otherwise in good condition. Distance to be twenty-five miles, and I would suggest starting one at the wire and the other at half-mile post.

"There shall be no purse, percentage of gate receipts, or any revenue whatsoever go to either contestant. The victor shall be the recipient of a silver trophy of suitable design, to be given by the club or organization under whose auspices the race is given.

"The best automobile track I have ever driven over, and the track I believe best suited for such a contest as proposed is the one mile course of the Cleveland Driving Park Company, at Glenville, Ohio, and I therefore name as one of the conditions that the proposed race be run over this course."

To this Fournier replied as follows:

"I will agree to meet Mr. Winton at the Empire track, Yonkers, which is a neutral course, and one on which neither would have the advantage; the prize to be a silver trophy emblematic of the championship of America. Following this race I will agree to meet Mr. Winton in a second match at the Cleveland Driving Park, under exactly the same conditions. Should each one of us win a match, I am willing to meet him in a deciding race, choice of same to be by toss of a coin.

"During my entire automobile racing career I have never competed for money, and I am perfectly willing that this shall be a so-called amateur contest, though I

am informed Mr. Winton has contested against a professional at Detroit, Mich.

"I am willing, with my representative, to meet Mr. Winton and his representative at any time or place he may designate, and complete the arrangements outlined above, which I believe are more than fair on my part."

As the result of a personal meeting on Wednesday at the show, a final agreement was reached for a match of three races, 25 miles each, the contestants starting at the wire and half-mile post, respectively. The first race will take place on the Empire City track on July 25, and the second on the Glenville track at Cleveland a week later, the third being on the track on which the better record is made in the first two races. Each track will contribute \$500 toward the purchase of a silver trophy.

Both Mooers and Oldfield have expressed their desire to meet the winner, and it is announced that Charles Jarrott, the English racing man, has cabled to Wm. Letts, of London, now at the show, that he also wishes to try for the honors. Fournier will bring to this country a Mors car of 120 horse power.

Minneapolis Automobile Speed Bill.

Special Correspondence.

MINNEAPOLIS, Jan. 17.—An automobile bill introduced at the present session of the State Legislature by L. H. Johnson, of Hennepin County, regulates the speed limit in cities and in the country. The chauffeurs are obliged to bring their machines to a four-mile maximum at crossings, and are required to come to a standstill when signaled by the driver of a team. The speed limit is fifteen miles in the country and eight in the city. Gasoline machines must be provided with mufflers.

During the fall a great number of complaints came from farmers in the vicinity of Minneapolis because of reckless riding by automobilists.

The proposed Minneapolis ordinance was sent back to committee several weeks ago. At the council meeting at which the measure was read Alderman Holmes gave notice that he would introduce a general vehicle ordinance. This has not been heard from since, but will probably appear in a short time.

Mrs. E. L. Guilder, of Springfield, Mass., has been invited by the Riverside Automobile Club, of New York City, to go to Paris to attend the automobile races there in March. Mrs. Guilder was the only woman to enter an automobile in the matinee meet held in Hampden Park, Springfield, by the Springfield Automobile Club in October.

PASADENA AS AN AUTOMOBILE TOWN.

ANNUAL CARNIVAL OF FLOWERS.

Fifty Odd Machines of All Types Owned and Used, Including Fifteen Touring Cars—Local Club of Seventeen Members—Two Storage Stations With All Facilities.

Special Correspondence.

PASADENA, Jan. 12.—Pasadena has the only strictly local automobile club on the Pacific Coast, and although our population is less than 15,000, more than fifty automobiles are in use in this pretty little city. Six of them are Packard touring cars. Of other touring cars owned here one is a Winton, one a Mobile, three Peerless, three Autocars and a Panhard—fifteen touring cars owned by residents, besides some owned by tourists spending the winter here. Of other gasoline cars there

ho (Waverley) beautifully decorated with flowers. Among the dozens of other automobiles in the parade and along the reviewing place, on the famous Orange Grove Avenue were noticed about a half dozen each of Wintons, Autocars and Packards, and several Peerless cars. Of the others the Oldsmobile predominated, and steam Stanhopes ranked next in number. The owner of the South Pasadena Ostrich Farm had an Oldsmobile finished in white.

Pasadena was the first city on the Coast to build a two-story brick automobile livery, not even Los Angeles or San Fran-

PASADENA TOURNAMENT OF ROSES.



Decorated Steam and Electric Autos.

are about a dozen Oldsmobiles, two De Dions, a Knox, St. Louis, Rambler, Elmore and some home-made machines. There are many of the early type of steamers, and nearly a score of electric carriages, most of the electrics being Waverley's and Americans, although there is a Baker Stanhope and some of the Woods machines.

The Pasadena Automobile Club is composed of seventeen members. The officers are Ellicott Evans, of Buffalo, president; King Macomber, vice-president; C. B. Scoville, second vice-president and treasurer; J. T. Pugh, secretary; Board of Governors: J. T. Pugh, Tracy Drake, H. T. Kendall, H. J. Macomber, R. H. Gaylord and J. B. Miller.

The club will endeavor to secure a more liberal city ordinance, and to overcome some of the public prejudice against motor cars.

TOURNAMENT OF ROSES.

The Fourteenth Annual Tournament of Roses was held on New Year's Day. The officers of the Carnival Association rode in a flower covered electric surrey (an American) and the directors had an electric tally-



Directors of the Tournament in Electric Surrey.

Officers of Tournament in Electric Surrey.

cisco having yet put up an exclusive automobile building. Hodge Bros. & Co., outgrowing their establishment a year ago, moved to extensive quarters on Union Street, but last Fall found even this big building too small and had a large brick building erected for them. Their large garage is now about filled on account of the Winter tourist population, and they will probably have to use part of their second floor showroom for storage. This firm has the Coast agency for the Peerless, and has sold several in this city, but had to wait all the past season for machines. They also handle the Knox, and several other makes are to be carried. They build and repair gasoline, electric and steam carriages, and have a well equipped machine shop.

Charlie Bell, formerly a well known bi-

cycle man, has an automobile garage adjoining the Pasadena Machine Shop on Broadway, directly opposite the beautiful Southern Pacific depot and Y. M. C. A. building. Mr. Bell is agent for the Oldsmobile and the St. Louis, and so far has stored gasoline cars mostly. The building was constructed for a garage, and the street in front is paved with asphalt, so that Mr. Bell's place is much patronized. The machine shop adjoining is fitted to do any kind of automobile repair work.

E. R. Braley & Co., who conduct the pioneer bicycle establishment of this city, and one of the most successful bicycle agencies in the West, now have the local agency of the Waverley electric carriages.

As Los Angeles is but ten miles away, and connected by five electric and steam roads, many of our people buy their automobiles in the City of Angels, where there is much competition and many machines on hand to try before buying. Therefore most



First-Prize Winning Gasoline Car.

of the fifty odd machines owned here were purchased there.

An automobile club of only five members, but these most enthusiastic, is in existence in Shreveport, La. The machines represented are a 10 horse power Columbia, a Baker electric runabout, a Columbia electric trap, a Locomobile and a Crestmobile. The favorite machine in Shreveport is of the electric type, because of the extremely level character of the city and surrounding country. The laws permit a speed of only eight miles an hour within the city, but no limit is placed on the speed outside. Two lights are required, and a gong must be rung at all crossings.

Four Mobile wagonettes used by R. H. Macy & Co., of New York, to carry customers from their old store to the new one during the twenty-five days just preceding the holidays, carried 15,850 passengers. During the time of service there were ten days of rain, hail or snow, with blizzard like conditions on two days. The company cites this record as a demonstration of the practicability of the motor vehicle for public service purposes.

MILLIONS ARE WANTED FOR ROAD IMPROVEMENT.

NEW YORK SUPERVISORS MEET.

Fourth Annual Conference Began in Albany on Tuesday—Standing Committee Recommends Preparation of Bonding Bill and \$2,000,000 Appropriation for 1903.

Special Correspondence.

ALBANY, Jan. 20.—State Engineer E. A. Bond presided over 200 delegates to the fourth annual meeting or conference of good roads advocates held here to-day. They represented for the most part good roads committees from the various boards of supervisors of the State. The State Engineer reported on the work done during the past year, showing that there are 46 counties petitioning for 1,100 miles of road with 418 miles of road covered by the plans adopted by supervisors of counties and a total mileage of good roads completed to date of 186. The first appropriation for work under the Higbie-Armstrong act was \$50,000 in 1898, and during that year there were 17 petitions for 502 miles. This has increased until the State's appropriation last year was \$795,000, and the appropriations of the counties to meet their half of the expense of building the roads they have petitioned for has reached the total of \$1,748,115.96. For the five years the total of State appropriations is \$1,465,000, while the counties have appropriated for their half of the roads they want built \$3,341,964.96.

A committee on permanent organization of fifteen was appointed, and then delegate J. Pierrepont White, of Utica, read the report of the standing committee. It is an interesting document in many respects. Its recommendations are:

The appropriation of \$2,000,000 for the present year's work under the Higbie-Armstrong act. This the committee thinks no more than right, because since a year ago 27 counties have appropriated \$2,007,812.50 as their half of the cost of constructing 470 miles of road and it remains for the State to meet it and continue the construction.

The adoption of a resolution bonding the State for \$50,000,000 for good roads. It has taken five years to complete 186 miles of improved highways and to place 167 miles of highways in course of construction, while at the same time 2,414 miles have been asked for. If the State should build 200 miles of improved roads each year it would yet take ten years to catch up with the number of new and better roads the counties have already asked for. Hence the necessity of the bond bill to secure a speedy completion of the roads already asked for under the present law.

The passage of a wide tire act of a compulsory character to preserve the roads already built.

The passage of a law to compel the local authorities in each county to erect sign posts on the main highways and market

roads and to make failure to do so a misdemeanor.

A bill to provide for the bonding plan was ordered prepared and it is to be introduced at an early date. It will provide for the issue of no more than \$5,000,000 of bonds in any one year to bear interest at 3 per cent. and with a 2 per cent. annual sinking fund. The principal and interest on these good roads bonds to be paid by the State and half of the same charged back on the counties and towns as now provided in the Higbie-Armstrong act, viz.: 35 per cent. to the counties and 15 per cent. to the towns benefited by the good roads built.

Chairman Potter in his speech dwelt on the workings of the Fuller act as amended last year, whereby those towns which adopt the money highway tax system have 50 per cent. of the money they expend on highways rebated by the State. He also favored the appointment of county engineers to supervise all work of repair or improvement of highways.

Frank D. Lyon, of Broome, made an address in the afternoon on "The Economic Measures by Counties for the Improvement of Highways." In the course of this he said:

"Highways in the neglected condition in which they are found to-day throughout this State isolate the farmer for from three to five months in the year, drives the young man or woman to the city or village as a result of discontentment, and is creative of centralization of population, which is becoming more and more a problem difficult of solution.

"An improvement of the system of highways of the State of New York means a saving to the agriculturist in the delivery of his product to his local markets of from \$7,000,000 to \$10,000,000 annually. It means a saving to the average county of the State of from \$150,000 to \$200,000 annually. It means enhanced valuation of farm properties and farming communities, the repopulating of the same and a general air of prosperity and progressiveness."

BROWNLOW NATIONAL ROAD BILL ENTHUSIASTICALLY SUPPORTED.

Special Correspondence.

WASHINGTON, D. C., Jan. 17.—It will be good news to motorists in all parts of the country to learn that Representative Brownlow, of Tennessee, is enthusiastically working up sentiment in favor of his measure for Federal, State and municipal co-operation for good roads, the text of which was published in the December 27 issue of THE AUTOMOBILE. From all parts of the country have come messages to Mr. Brownlow indorsing his bill and promising support. He is also in receipt of letters from the State Highway Commissioners of New York, New Jersey, Massachusetts, California, Connecticut and Vermont. From what your correspondent learns at the Capitol, no effort will be

made to get the bill before Congress at the present session, but the groundwork for its consideration in committee and then by the House of Representatives will be laid so that action may be begun at once in the fifty-eighth Congress.

Representative Brownlow talks very entertainingly on his project. To your correspondent he recently said: "The fact that the United States Government has taken no substantial part in building or maintaining public highways in this country for the last two generations, is accepted by many people as final proof that the general government is forbidden, either by constitutional limitations or by sound public policy, from engaging in any such internal improvement. On the other hand, it should be noted that no system of public highways was ever built up or maintained in any country without the substantial aid of the general government of that country. The almost universal lack of improvement of our public road system is directly referable to the fact that there has been no well established system or policy pertaining to the question. Those who have done most to agitate for permanent improvements have found that the farmers of the country have almost invariably been opposed to any general plan heretofore suggested for the building up of permanent and durable roads.

"The real reason for the farmers' objection is found in the fact that, according to the ordinary scheme of improvement, he would be called upon to pay the entire burden of cost. Considering this long-continued opposition by the people in the rural districts, and the lack of policy on the part of the general government, and especially considering that road building is undoubtedly a public duty which rests upon the government in some form, it seems that the farmers are entitled to some assistance in bearing the necessary burden of cost. My measure seeks to establish this policy. It is a policy of co-operation and seeks to bring in the general government as a co-operating factor to work in connection with any State or political subdivision thereof, so that the United States should furnish one-half the cost of improvement and the State co-operating should furnish the other half.

"It is a remarkable fact that the United States Government has already appropriated a million dollars for road building in Porto Rico, and another million for the Philippines."

Pleasure Drive for Indianapolis.

Special Correspondence.

INDIANAPOLIS, Jan. 17.—Capitol Avenue is to be resurfaced and otherwise improved next spring, and then the heavy traffic will be excluded. The Hoosier capital has long felt the need of a speedway and pleasure drive, such as Mayor Bookwalter proposes to make of this.

The mayor is a great lover of automobile, and will use what means is in his

power to reserve the new drive for owners of motor vehicles and fine horses. The contemplated improvements include the construction and maintenance of a number of flower beds along the course. The speedway will extend from North Street to a point a short distance beyond Fall Creek. After all improvements have been made the course will be turned over to the Park Board, which will keep it in first-class condition. Many beautiful homes of the wealthiest citizens grace the historic driveway.

Mayor Bookwalter, when asked if a motorist might not make a little trial of the speed of his machine once in a great while, smiled as if he thought that such a thing might be possible.

CITY AND RAILROAD RESPONSIBLE FOR BAD PAVING.

Special Correspondence.

NEW HAVEN, Jan. 19.—An interesting judicial decision holding both the city and street railroad company responsible for injuries sustained by an automobilist as a result of an accident due to defective pavement has been handed down by Judge Rorabeck, in the civil side of the Superior Court for this county. The case was that of George Lavigne, a well known gun maker and automobilist, who brought suit for \$3,000 damages against the city of New Haven.

While Mr. Lavigne was riding in his automobile at Chapel and Howe streets, on May 20 last, the machine caught in a hole in the brick pavement. This hole was 4 feet long, 7 inches wide, and 4 inches deep, and was between the rails of the Fair Haven & Westville trolley road. The course of the machine was turned so that it ran out of the street against a tree and Mr. Lavigne was thrown out, straining his left leg and being badly and permanently injured, he claimed.

The hole in the street had existed for some time, and it was contended at the trial by the plaintiff that under the law either the city or the trolley company could be held responsible for the damage, as the city must see that the road kept its tracks in order, and the road was responsible for the condition of its tracks within a certain distance of the rails, which distance was within the scope of the present action.

The court sustains this view. He says:

"The evidence shows that the plaintiff's injury was caused by an excavation of such depth and width in the street as to be dangerous to public travel, which had existed for some time prior to the day of the accident.

"The excavation was inside the tracks of the railroad company.

"I am also of the opinion that the plaintiff was in the exercise of due care when the accident occurred.

"The determination of the case involves an inquiry as to the extent of the duty of

the defendant city to repair the streets inside of the tracks of the railroad company. In this connection it is quite important to consider whether or not the city has the power to remove the defect and put the street in safe condition. Section 3,837 of the Revised Statutes provides that the street railway company shall repair a certain portion of the street to the satisfaction of the authorities of the city, which is bound by law to maintain such highway. Such municipality may also order such repairs within a certain period, and upon failure of the company to make the repairs as ordered, may make such repairs and recover the expense thereof from the company.

"I am inclined to the opinion that our statutes do not release the city from the statutory liabilities to the traveler, but simply make the railway company also liable to him, or answerable to the city when compelled to pay. The municipality is primarily liable, although an injured party may proceed against it or the railway corporation.

"Therefore I have reached the conclusion that the plaintiff is entitled to recover substantial damages, which I find to be \$400."

Frisco Club Upholds Order.

Special Correspondence.

SAN FRANCISCO, Jan. 5.—Some time ago one of the policemen of Golden Gate Park, while endeavoring to arrest an automobilist who was violating a speed ordinance, fell from his horse and was injured. The Automobile Club of California, desiring to show that it approves the efforts of police officers to compel automobilists (whether members of the club or not) to respect and obey the laws regulating the use of motor vehicles, decided to present the sum of \$50 to the policeman. The club took the opportunity at the same time of warning its members that they are expected to set a good example to others in such matters.

In the spring or early summer the Automobile Club proposes to run down to Del Monte and spend three or four days there, making trips and holding races. The intention is to offer a series of events of such interest as to attract many visitors, who need not necessarily be automobilists, to enjoy an outing at that picturesque spot.

Bridgeport Club Opening.

The opening of the new club rooms of the Automobile Club of Bridgeport was not held on January 5, as intended, but was postponed to February 2, as the changes being made in the new storage station of M^r. Brangedee, at 625 State Street, have not been completed and there was no business to come before the club, except the admission of some new members. The committee on furniture has purchased the necessary articles and they will be installed in a few days.

FIRST ANNUAL MEETING OF AMERICAN AUTOMOBILE ASSOCIATION.

The American Automobile Association, formed last year at the Chicago Show, held its first annual meeting on the afternoon of January 20 at the clubhouse of the A. C. A. President Scarritt was in the chair, with the following delegates present:

Chicago Automobile Club, Frank X. Mudd; Long Island Automobile Club, A. R. Pardington and Frank G. Webb; Automobile Club of America, Jefferson Seligman and J. M. Hill; Rhode Island Automobile Club, Dr. Julian A. Chase and H. H. Rice; New Jersey Automobile Club, W. J. Stewart; Grand Rapids (Mich.) Automobile Club, C. B. Judd; Cleveland Automobile Club, Windsor T. White; Automobile Club of Philadelphia, H. Bartol Brazier.

The following clubs, not members of the Association, were also represented: Albany Automobile Club, Dr. Millbank and C. M. Page; Cincinnati Automobile Club, Max C. Fleischmann; Massachusetts Automobile Club, Dr. W. S. Shrigley; Berkshire Automobile Club, S. G. Colt.

Mr. Scarritt was renominated for the office of president, but declined, and Dr. Julian A. Chase was nominated and elected, the full board of officers being as follows:

President, Dr. Julian Chase, Rhode Island; first vice-president, Honore Palmer, Chicago; second vice-president, E. E. Schryver Reese, Cleveland; third vice-president, Charles B. Judd, Grand Rapids; treasurer, Harlan W. Whipple, Automobile Club of America; secretary, S. M. Butler; directors, Frank G. Webb, Long Island; Dr. Millbank, Albany; William J. Stewart, New Jersey; F. C. Lewin, Philadelphia; M. C. Fleischman, Cincinnati; A. R. Pardington, Long Island.

The question of amateurs and professionals in racing was referred to the Board of Governors. New racing rules prepared by the race committee were submitted, but will not be made public until they have been passed on by the clubs. Two clubs, the Albany and the Cincinnati, were elected to membership.

Paris-Madrid on May 24.

Cable advices announce the fixing of the date for the Paris-Madrid races for May 24. The Automobile Club of France will keep the entry list open between January 15 and April 15 at the regular fee. After the latter date the entrance fee will be doubled, the final date for receiving entries being May 15. The club is organizing a competition of timing apparatuses, and has arranged to award a \$200 prize to the successful exhibitor. The instruments to be used in this test must be submitted to the club by February 9 next.

The death is announced of P. C. Lewis in Boston, Mass. He was one of the pioneers of automobilism in the Hub, and opened the first automobile station there.

MOTOR BOATS

A National Launch Users' Association.

In line with the suggestions recently made in THE AUTOMOBILE for a union of those yachtsmen interested in power launches, a preliminary meeting was held on the evening of January 20 at the Columbia Yacht Club, Eighty-sixth Street, North River, New York. It was decided to organize a national association and a special committee, including F. B. Jones, Indian Harbor Y. C.; W. G. McClave, Columbia Y. C., and A. B. Coles, Manhasset Y. C., was appointed to draw up a constitution and by-laws to be submitted at a meeting some time in February. Messrs. H. J. Gielow, Atlantic Y. C.; W. Schuyler, Atlantic Y. C., and F. B. Jones were appointed a special committee to prepare measurement rules. Notice of the next meeting will be given, and it is hoped that a representative attendance will be had from the large number of motor launch users about New York and the Sound, and from more remote parts of the country.

Yachtsmen and the Law.

It has long been the custom for supervising inspectors of steam vessels at the port of New York to issue licenses as masters of pilots to such owners of yachts as were able to pass an examination, and many yachtsmen have availed themselves of this privilege. A new incumbent of the office, Supervising Inspector R. S. Rodie, has refused to issue such licenses unless the applicant can show three years' actual experience at sea, a year each as third mate, second mate and first mate, in the merchant marine. His claim is that no other action is possible under the law, and that all licenses issued by his predecessors are illegal and void. Under this ruling professional captains who have grown up in sailing yachts and who are fully competent to command similar yachts with steam power can obtain licenses only by serving for three years on merchant vessels in subordinate capacities.

There has been no complaint of any evils or abuses in connection with the old system, and there is on the surface no apparent reason for the very stringent enforcement of the letter of the law. If the United States laws relating to steam and sailing vessels, both commercial craft and yachts, were in any way fitted for the present day, and if all laws were impartially and fairly enforced by the inspectors, there could be no cause of complaint. On the other hand, it is a patent fact that the existing laws are antiquated and inadequate in the extreme, and that the manner in which they are enforced in some cases and relaxed in others is the subject of well-grounded criticism. Yachtsmen in particular have suffered from the inherent de-

fects of the laws, the officiousness and unfair discrimination of subordinate officials, and also the attacks of hostile legislators, this last case being but one of many. Considering the benefits which accrue to the country at large from its yachting, the expense of which is borne wholly by private individuals with no thought of gain, it would seem that the Government, even though unwilling to accord special favors to yachtsmen, might at least leave them alone so far as they harm no one.

Yawl-Rigged Launched for Norway Trip.

NEW HAVEN, Jan. 19.—A Connecticut clergyman, whose name is withheld for the present, has just completed a 50-foot launch in which to pay a visit to his birthplace in Norway the coming summer. The craft will be yawl rigged for the trip. She has been built of the most durable materials. The engine has now been placed in her and she will be ready for launching as soon as the backbone of winter is broken. She is 11 feet in width and about 5 1-2 feet deep.

The boat will be powered with a 50-horse power, three-cylinder, four-cycle engine built by Craig. With her proposed auxiliary rig, which will be valuable in heaving to in a gale or in making runs with free winds, she will be especially seaworthy. She will make the return trip to this country before fall.

Connecticut seems to be setting the pace in the equipment of motor boats for long cruisers with canvas. The *Wizard* has completed a run to Florida with this help, and a new boat, the *Palmer*, is being built to take canvas up to the great lakes and now the above boat is mentioned.

A New Gasoline Cruiser.

There is now in frame at the shipyard of Green Brothers, Bridgeport, Conn., a cruising gasoline launch designed by W. P. Stephens for J. A. Serrell, of Bayonne, N. J. The yacht was planned for cruising exclusively with but one paid hand, and the details of the accommodation have been carefully worked out by the owner, presenting some novel features. The hull is 66 feet over all, 56 feet water line, with 3 feet overhang forward and 7 feet aft, the latter of the whaleboat form. The breadth is 13 feet 6 inches and the draft is 3 feet 6 inches over shoe, the draft to rabbet being 3 feet, while the minimum freeboard is 3 feet 6 inches. The midship section has considerable rake, giving a very long entrance and a correspondingly fine run.

The frames will be carried above the sheerstrake to form the sides of the house, the roof, which will have but little round, forming a deck 40 feet long and 13 feet 6 inches wide, the highest point being but 6 feet 6 inches above the water.

The motor, a 25 horse power Globe, will be placed almost amidships, in an engine room 8 feet 9 inches long, on the port side

being the toilet and galley. This gives a forward cabin and after cabin each about 16 feet long, fitted with berths and divided by curtains. The pilot house is in the center of the upper deck, the man at the wheel standing on a platform placed immediately over the cylinder heads. With windows on every side, he has a clear view of the entire horizon, his starting lever and engine mechanism are close at hand, being carried up through the platform, and by stepping down a short ladder he is at the side of the engine. The space below the floor will be utilized for water tanks, and the gasoline tanks will be fitted in the after overhand above the water. The yacht will carry two masts and leg o'mutton sails for emergencies or use when the wind favors. She will be ready early in the spring.

A New Auxiliary Schooner.

The designs for a large cruising auxiliary has recently been completed by Small Bros., of Boston, in connection with Captain E. F. Small, for many years sailing master for W. Amory Gardner, who will own the new yacht. Mr. Gardner at one time owned the schooner *Rebecca* and more recently the old Cup defender *Mayflower* under the schooner rig, using her for cruising. The new yacht has been planned by Captain Small as an improvement on *Mayflower*, the lines being worked out by his cousins, Small Bros., yacht designers.

The dimensions are 125 feet over all, 85 feet water line, 24 feet breadth and 12 feet draft without centerboard. The displacement will be 138 tons and the lead keel will weigh 40 tons, with 10 tons of lead inside. The yacht will be built of wood by Rise Bros., of East Boothbay, Maine, and will cost about \$40,000.

The lines show a long stright keel, with straight sternpost raking about 50 degrees, and moderate overhangs. The centerboard will house under the cabin floor and will drop about 8 feet below the keel. The arrangement is purely that of a sailing yacht, the gasoline motor of 40 horse power being placed partly below the floor and just abaft the main stairway, where it is out of the way. The screw works in the deadwoods in a small aperture. The ordinary schooner rig of cruising proportions will be carried.

Many Designs for New Launches.

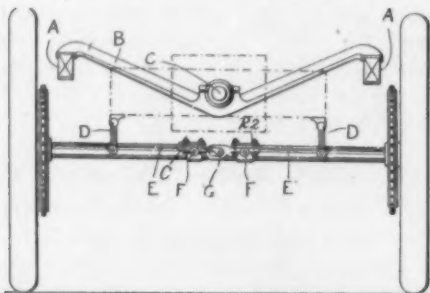
Frederic S. Nock, the small boat designer of New London, Conn., has a busy winter of work before him. A summary of new things which will come from his hands is as follows: Speed launch, 28 feet long, for L. J. Skinner, Minneapolis, Minn.; speed launch, 28 feet, for P. N. Goodrich, Boston, Mass.; launch, 46 feet, for Francis Wederkinch, Mystic, Conn.; high-speed launch, 55 feet on water line, for S. B. Kitchell, Coldwater, Mich.; one-design class knockabouts for the Warwick Club of Massachusetts; yawl, 25 feet on water line, for E. C. Nichols, New York City; also, several minor designs.

Patents

Vibration Equalizing Support for Motors.

No. 715,954.—A. Bochet, of Paris, France.

This is a trunnion support for explosion motors, by which the motor is swiveled about the axis of the crank shaft, and the tendency of the cylinders and crank case to rotate backward in the opposite direction from that of the flywheel is absorbed

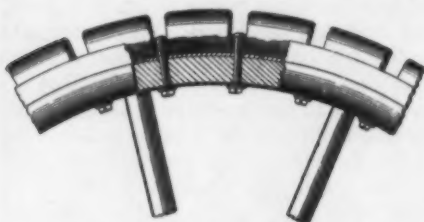


BOCHET SUPPORT FOR MOTORS.

and cushioned by springs, thus deadening the abrupt impulse on the shaft due to the explosions. In the drawing *AA* are the side sills of the frame, and *B* represents one of two similar transverse supports, between which the motor is swung in the center of its shaft at *C*. The links *DD* connect the cylinder heads with the ends of flat springs *EE*, which are pivoted at *FF* and whose inner ends are loosely articulated at *G*, allowing the springs a restricted amount of play.

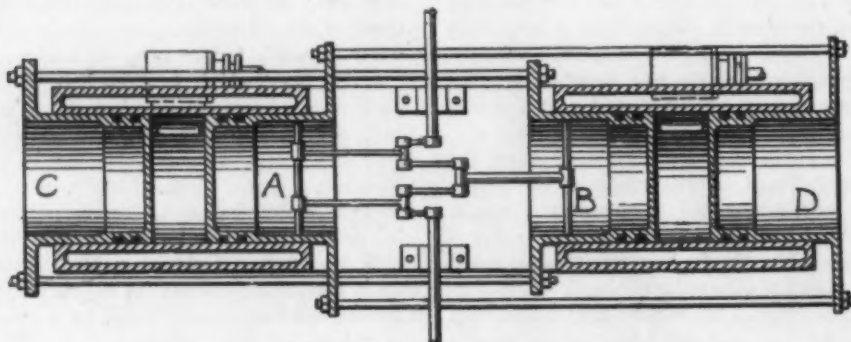
Sectional Rubber Tire.

No. 715,361.—H. H. Durr, of New York. This invention consists in the use of



DURR SECTIONAL SOLID TIRE.

bolts between the sections of the tire, the bolts passing through metal strips which bear against the vulcanized canvas and



INGLIS TWO-CYLINDER, FOUR-PISTON BALANCED MOTOR.

base of the rubber tire next to the rim. The object is to hold the tire in place as securely as possible.

Double Pneumatic Tire.

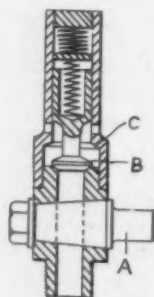
No. 714,164.—W. Edmund, of Ealing, England.

A pneumatic tire comprising an outer tire with tread, armored or internally strengthened, and an inner tire, with canvas and rubber walls, but without thickened tread, inside the outer tire and not quite filling it. It is proposed to inflate the inner tire first and then the outer one, to substantially the same pressure, the inner one coming into service if the outer one punctures.

Relief for Compression.

No. 714,902.—J. W. Hinchley, London, England.

A plug comprising a cock *A* and a spring seated valve *B*. The spring permits the excess of compressed gas to leave the valve and escape by the orifice above, but the explosion, coming quickly,



HINCHLEY RELIEF COCK.

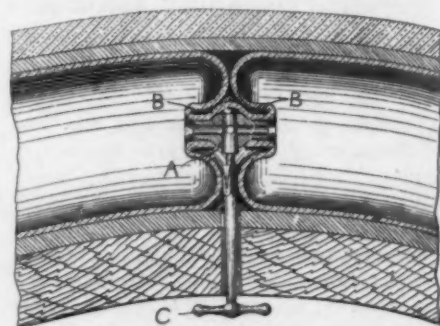
lifts the valve still further and seats it at *C*, when the cock may be closed.

Balanced Explosison Motor.

No. 712,067.—C. E. Inglis, of Cambridge, England.

This is an engine of the arrangement shown in the drawing. It has two cylinders and four pistons, pistons *AB* being connected together by outside rods, and pistons *CD* likewise. Pistons *A* and *D* are connected to opposite crank pins, so that the two pairs of pistons move in opposite directions at the same speed, and have equal weights. For a steam engine in which every separation of the pistons

gives a working stroke, the two inner pistons *AD* are connected to each other and to one crank pin, while the outer pistons *BC*, are similarly connected to each



GOOD'S CELLULAR PNEUMATIC TIRE.

other and to an opposite crank pin. This results in alternate impulses for the two cylinders.

Pneumatic Tire.

No. 716,031.—H. N. B. Good, of London, England.

In this tire the inner tube, instead of being continuous and endless, is divided into a number of sections or cells, which may be connected with each other for the purpose of inflating and then cut off by suitable cocks, so that the puncture and deflation of one cell will not affect the rest. To this end it is proposed to use cocks of the form shown at *A* in the figure, which are inserted through slits into

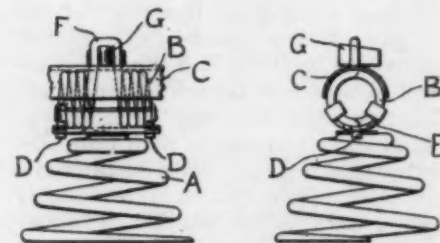
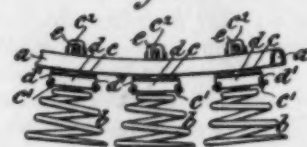


Fig. 1.



HUTH BED-SPRING WHEEL.

the constricted portions of necks connecting the sections of inner tube, and which are then bound with wires *B*. The cocks are opened or closed by a socket wrench *C* inserted through the rim.

Spring Wheel.

No. 716,046.—A. H. Huth, of Middlesex County, England.

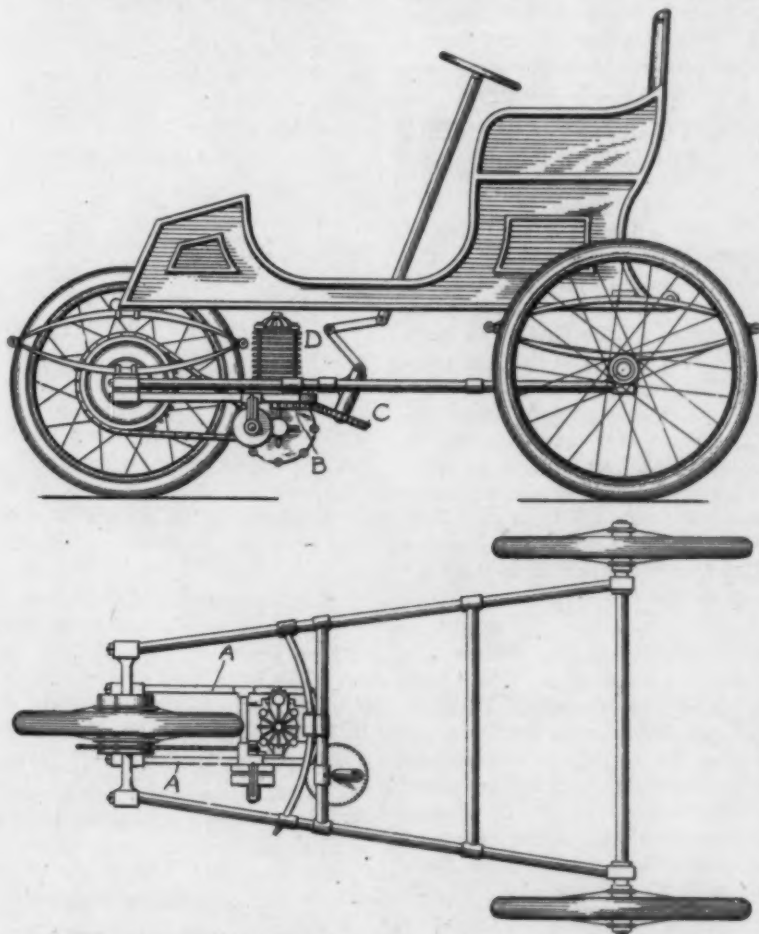
The claim of this device to attention is the fact that it provides resiliency or "give" to the tire in other directions than the vertical, the object of the inventor being to imitate the pneumatic tire in this

respect. To this end the usual springs *A* are supplemented by additional springs *B* next to the rim *C*, which is of semi-circular section to fit springs *B*. The latter spring has its two free ends *D D* fixed in a short semi-circular piece *E*, to which the apex of the main spring *A* is also fixed. To keep spring *B* in position, its middle is bent inward through the rim at *F* and secured by a key *G*.

Three Wheeled Vehicle.

No. 712,001.—A. E. Osborn, of New York.

This is a three wheel vehicle in which the front wheel is both driver and steerer.



OSBORN THREE-WHEEL, FRONT DRIVING AND STEERING VEHICLE.

The front wheel revolves on ball bearings on an interior pivoted hub, from which project the arms *A A*, to which is attached a toothed sector *B*, actuated by the pinion *C*, connected with the steering column as shown. The motor *D* is likewise carried on arms *A A*, and drives the front wheel suitable speed changing mechanism by a chain. The rear axle is rigid and the rear wheels revolve independently upon it. It is not obvious how, in such a machine as this, sufficient weight can be put on the front wheel for traction without impairing the stability.

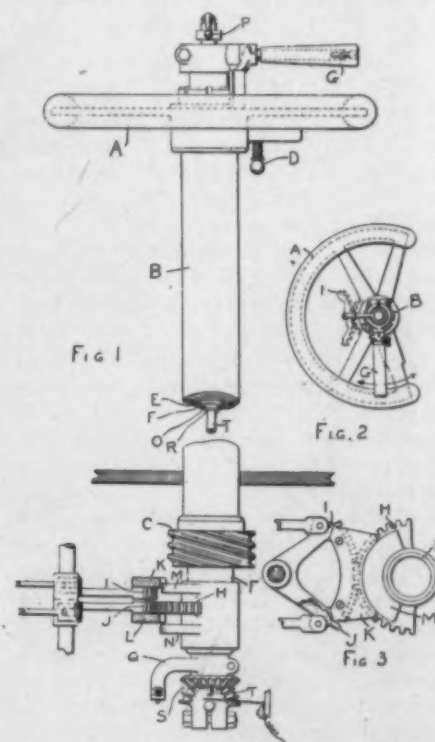
Control Mechanism in Steering Column.

No. 716,183.—H. Bartol Brazier, of Philadelphia.

This invention consists mainly in the combination with a steering column of means for operating the following parts: the clutches or sliding gears, the governor or throttle valve, the spark advance and the alarm, the object of the invention being to group the control of these features close together instead of separating them.

In the figure *A* is the steering wheel, connected with the outside tube *B*, to whose base is attached the worm *C*, which acts on a worm segment connected with the steering knuckles in the usual way. The steering wheel *A*, instead of being rigidly fixed to *B*, as is usual, is made segmental as shown in plan in Fig.

use against turning. Tube *O* connects with handle *P* above and with arm *Q* below, and operates the throttle, while tube *R* operates mechanism for advancing the



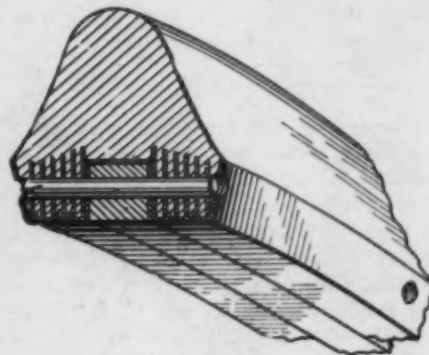
BRAZIER STEERING COLUMN.

spark through the bevel pinion and segment *S*. Pressing a button on rod *T* operates an electrical alarm through a contact at the bottom.

Stevens' Rubber Tire.

No. 711,081. A. L. Stevens, New York.

The essential feature of this invention is the formation of the base by interleaving strata of fabric between corresponding strata of rubber, the strata being in planes parallel to the plane of the wheel.



STEVENS STRATIFIED SOLID TIRE.

These several strata are vulcanized solidly together, the purpose of the invention being to afford means of securing the tire to the felloe more firmly than by other methods.

INDUSTRIAL

RAPID PROGRESS MADE TOWARD BOSTON LOCAL SHOW.

Special Correspondence.

BOSTON, Jan. 17.—There is every indication now that the automobile show here next March will be a success. Plans which were tentative a week ago have now been put into effect. Symphony Hall has actually been engaged for the week of March 16, and members of the new Boston Automobile Dealers' Association put up \$1,000 this week as a guaranty fund binding the dealers to support the project.

Officers of the new association are: President, Kenneth A. Skinner; vice-president, W. E. Eldridge; secretary, C. I. Campbell; treasurer, Arthur P. Underhill. Dues are \$5 per year; meetings take place on the third Tuesday of every month; annual meetings on the third Tuesday in each November.

There will be no attempt to make the Boston show an imitation of the two big shows of the year, in New York and Chicago. The plans are for a local show by agents. Manufacturers are not asked to exhibit, the dealers and special agents expecting to make the displays with the idea of showing Bostonians all the latest models that are actually on sale in their own city. The dealers expect the exhibition to be a revelation to many, as Bostonians are said to be about two years behind the times in respect to up-to-date automobiles actually in use.

The best guarantee that the show will be representative and interesting lies in the quickness with which the available space was taken. The main floor was divided into spaces representing in the aggregate about \$3,500 in rentals. At a meeting of the local dealers last Wednesday, spaces enough were actually engaged to account for \$2,600, and others not present at that meeting have since been assigned to places. The amount of floor space now taken, in all, represents about \$3,000.

EXHIBITS ALREADY ASSURED.

The dealers and firms that have taken one or more spaces are as follows: Automobile Headquarters (Pierce Motor-ette), Harry Fosdick (Winton), George H. Low (White), Reed-Underhill Co. (Knox and Stearns), International Motor Car Co. (Toledo steamer, Waverley electric and Cadillac gasoline), C. I. Campbell (Mobile), A. J. Coburn (Crest and Orient), Phelps & Dingle (Phelps gasoline), Fred E. Randall (Peerless), Kenneth A. Skinner (De Dion), A. T. Fuller (Northern), Bert Snow (American gasoline), H. E. Marvin (Columbia), George T. Gould (Long Distance), Stanley Brothers (Stanley), Pope-Robinson Co. (Rob-

inson), H. T. Wilson (Rambler), Bates Brothers (St. Louis, Thomas, Conrad gasoline and Conrad steamer), A. R. Bangs (Franklin gasoline).

Of the thirty-two spaces in the main hall the only desirable ones not taken are two of the four on the stage. One or two handsome foyers or promenade halls are available for additional exhibits, and it is planned to use these for special attractions and perhaps for accessories.

George Low, Kenneth Skinner and Harry Fosdick went to New York yesterday, one of their objects being to get in an early word with Fournier and perhaps a few others at the New York show, to induce them to bring some of their interesting foreign machines to the Boston show after returning from Chicago.

SAN FRANCISCO DEALERS ORGANIZING FOR ACTION.

Special Correspondence.

SAN FRANCISCO, Jan. 13.—A meeting of local automobile dealers at which the question of forming a dealers' association was discussed, was held on January 11. Another meeting will be held at an early day, at which it is probable that the association will be organized. Special attention will then be devoted to securing additional privileges for automobilists in Golden Gate Park. At present automobiles are permitted only on the southerly drive and must turn off from this in a southerly direction before reaching the westerly end of the park. It is thus impossible to get out to Cliff House through the park.

Some of the automobile dealers are talking about a local show, which will probably be held in Mechanics' Pavilion, the largest covered space in the State. It is likely that the exhibition will include not only automobiles and motor-cycles, but also sporting goods. B. B. Stanley has been appointed a committee of one to visit the dealers and consult with them about the project.

Enjoined from Brush Battery Use.

Special Correspondence.

BUFFALO, Jan. 17.—Judge John R. Hazel, in the Federal Court here, has granted an injunction restraining the Buffalo Electric Carriage Co. from using the Brush secondary storage battery. Last summer the Electric Storage Battery Co., of this city, began suit in the United States Circuit Court to restrain the company from using the battery and was granted an injunction. The Electric Carriage Company took an appeal, and now Judge Hazel has affirmed his former decision.

Exports from New York.

Exports of automobiles and parts thereof from the port of New York for the week

ended January 17, are reported as follows: London, \$9,809; Liverpool, \$9,800; New Zealand, \$5,249; China, \$1,910; Philippine Islands, \$1,280; British West Indies, \$1,053; British Possessions in Africa, \$956; Mexico, \$544; British Australia, \$450; Southampton, \$375; British East Indies, \$160; Manchester, \$80; Malaga, \$50.

Various Trade Items of Interest.

The Morris Corkhill Motor Co., of Rochester, has been incorporated at Albany with \$5,000 capital. The directors are J. M. Morris, Thomas Corkhill and C. L. Reed.

Business men of Warrensville, O., have formed a \$20,000 corporation, known as the Warrensville Automobile Traction Co., to establish an automobile stage line between the Cleveland public square and Warrensville, a distance of seven miles. A committee has been appointed to secure figures on coaches to carry sixteen passengers.

Articles of incorporation were filed recently by the Colorado Automobile Co., capitalized at \$50,000. The directors of the company for the first year are George W. Wood, who is also president; M. W. Gane, Frank R. Ashley, Alvin B. Daniels and Lewis Lindahl. The principal office of the company will be in Denver and the business will be mainly in Colorado.

The Geneva Automobile & Mfg. Co. has increased its capital stock from \$100,000 to \$150,000. J. A. Carter is president. Additions to its factory at Geneva are planned.

Incorporation papers have been issued at Albany to the Central Automobile Co., of New York, with capital stock of \$150,000. The incorporators are F. Betterton, Brooklyn; H. F. Randall, East Orange, N. J., and C. J. Gleason, New York.

The Haynes-Apperson Co., of Kokomo, has made arrangements to open a branch store in Chicago. Ground has been secured in Michigan Avenue, south of the present "automobile row," and a new building is to be constructed for the company.

John C. Coleman has been appointed temporary receiver of the German-American Automobile Co., of New York, against which a petition in bankruptcy was filed last year on the application of Morris J. Hirsch. The schedule filed in U. S. District Judge Adam's Court shows that the assets consist of an automobile valued at \$2,500 and factory equipment.

The Ohio Oldsmobile Co., of Cleveland, has been incorporated with \$10,000 by R. R. Owen, W. S. Wilson, W. D. McTigh, P. R. Fahey and H. W. Hudson. This company succeeds the old Oldsmobile Company, which was affiliated with the New York concern. R. M. Owen, who is at the head of the New York concern, is no longer identified with the Ohio enterprise.

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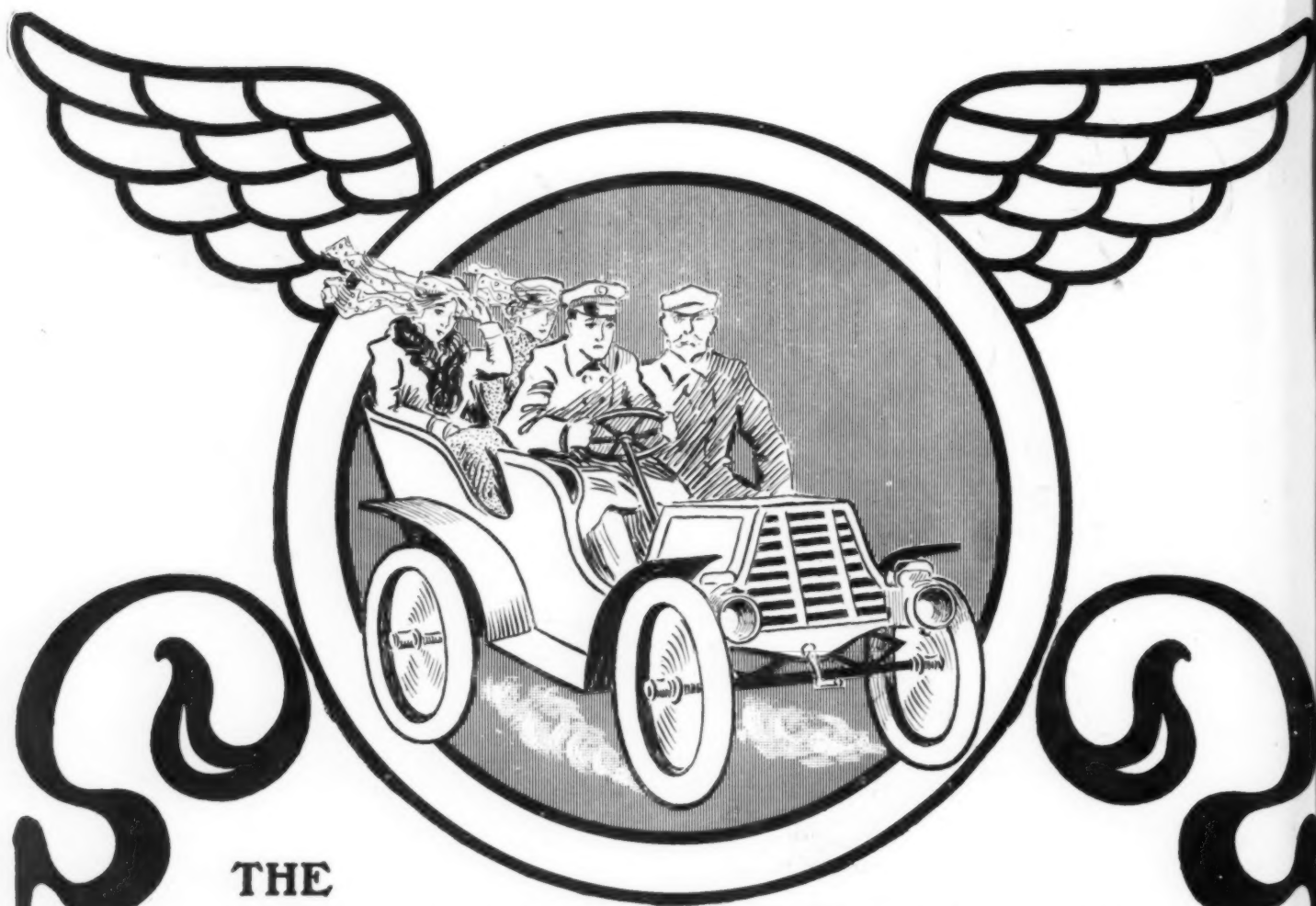
THE AUTOMOBILE

THIRD ANNUAL
AUTOMOBILE SHOW
IN
MADISON SQUARE GARDEN
NEW YORK
JANUARY 17 TO 24, 1903



THIRD SHOW NUMBER

PRICE 10 CENTS



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Appreciating the fact that requirements vary as to Single Tube and Detachable Tire Construction, we offer the most reliable of both types—*The Honest Standards.*

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